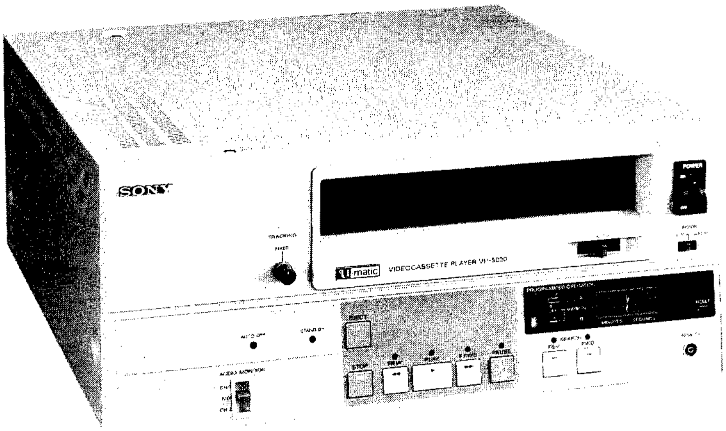
U-matic

VIDEOCASSETTE PLAYER

VP-5020



SONY®

SERVICE MANUAL

SPECIFICATIONS

System

Video recording	Rotary two-head helical scan system
Luminance	FM recording
Color signal	Converted subcarrier direct recording
Video signal system	EIA standards, NTSC color

Video

Output	
VIDEO OUT	BNC type x 1 1.0 V(p-p) ±0.2 V(p-p), 75 ohms, unbalanced, sync negative
TV	8 pin x 1
Horizontal resolution	240 lines
Signal-to-noise ratio	More than 45 dB

Audio

Output	
LINE OUT CH-1, CH-2	Phono jack 1 in each –5 dB (47 kohm load)
AUDIO MONITOR	Minijack x 1 –5 dB (with 47 kohm load)
TV	8-pin x 1
Signal-to-noise ratio	More than 48 dB (at 3% distortion) Both channels 1 and 2
Frequency response	50 – 15,000 Hz (channels 1 and 2)

Special functions

Pause	A still picture is obtained, with automatic long pause function
Search	Possible (about 5 times of normal speed in forward and reverse direction)
Tracking control	Possible
Skew control	Possible
Dropout compensator	Internal

Tape transport

Tape speed	9.53 cm/sec (3 3/4 inches)
Playback time	60 min (with KCA-60K)
Fast forward and rewind time	within 4 min (with KCA-60K)
Wow and flutter	0.2% RMS
Tape compatibility	U-matic video cassette tape
Usable tape	KCA, KCS, KSP type tape

General

Power requirements	120 VAC ±10%, 50/60 Hz ±10%
Power consumption	53 W
Operating position	Horizontal
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Operating temperature	5°C to 40°C (41°F to 104°F)
Dimensions	Approx. 424 x 193 x 489 mm (w/h/d) (16 3/4 x 7 5/8 x 19 3/4 mm) including projecting parts and controls
Weight	Approx. 16 kg (35 lb 4 oz)

Optional accessories

Color video monitor Sony CVM, PVM series
Remote control unit RM-690
Video and audio distributor DA-500
Video and audio switcher VCS-500
VTR selector RM-V5

Cleaning cassette KC-1C
Monitor connecting cable VMC-3P (3 m), VMC-5P (5 m), VMC-10P (10 m).
RF kit RFK-634
Rack mount kit RMM-507

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SECTION 1
GENERAL DESCRIPTION

1-1. FEATURES

Front loading system
Almost all of the functions including the cassette insertion can be controlled on the front panel. So the unit can easily be operated, and be mounted into the rack easily, and the space for installing the unit is saved.

Search operation
Playback at about 5-times normal speed is possible in both forward and reverse directions.

LED time counter
The time counter reads the CTL signals recorded on the tape and the LEDs indicate the point on the tape in seconds and minutes.

Automatic tape transport operation
The PROGRAMMED OPERATION selector allows you to locate a particular point on the tape easily and quickly, and also to play back a portion on the tape repeatedly.

Still picture
When the tape is stopped with the PAUSE button during playback, a still picture can be obtained. The guard band noise is limited to the upper or lower part of the screen so that the still picture is easy to see.

Long pause mode
When the tape is stopped in the pause mode for a long period of time, the machine automatically enters the long pause mode to avoid possible damage to the tape.

Remote control
The machine can be remotely controlled with an optional remote control unit.

Logic control
The logic control system allows you to change modes without pressing the STOP button.

Full automatic rewind
The tape is automatically rewound to the beginning when it runs to the end.

Timer operation
With the aid of a timer (optional), playback can be started and stopped when the player is unattended.

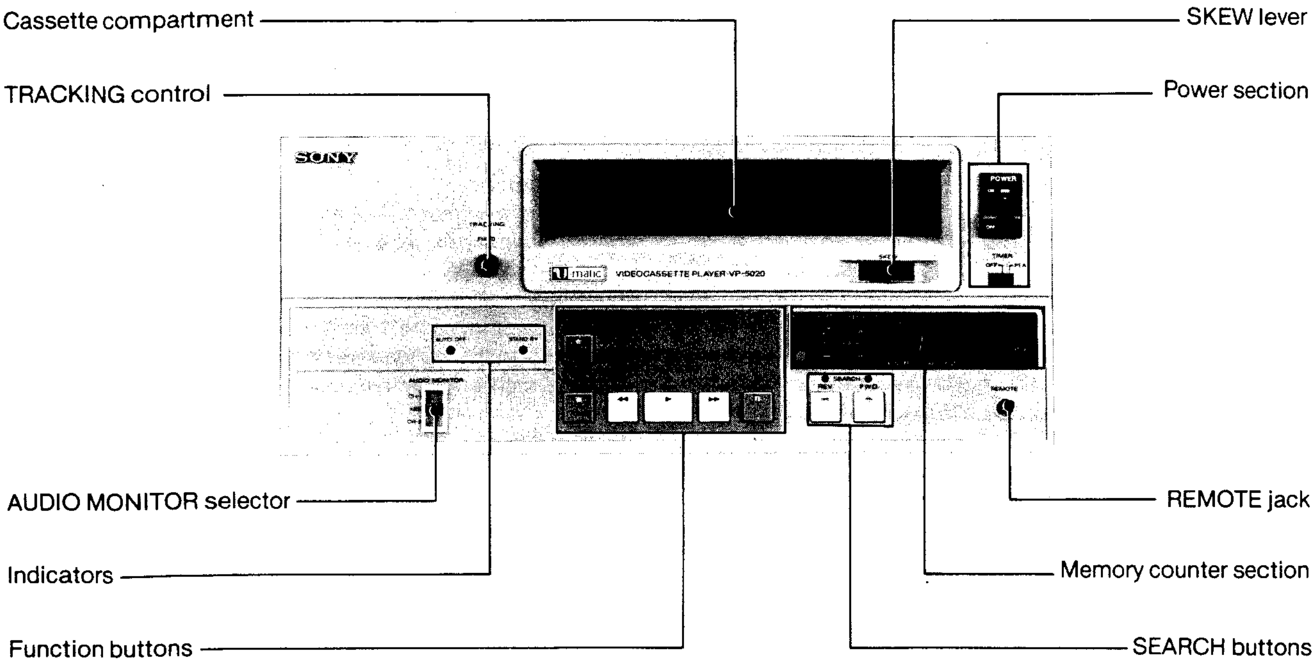
Stable playback picture
The servo system using a direct drive capstan motor and drum motor, and the digital servo IC developed by Sony assures a stable tape transport which reduces tape jitter.

Moisture detector
When moisture condenses on the video head drum, the moisture detector is activated and the machine stops to avoid possible tape damage. The AUTO OFF indicator lights to indicate moisture condensation.

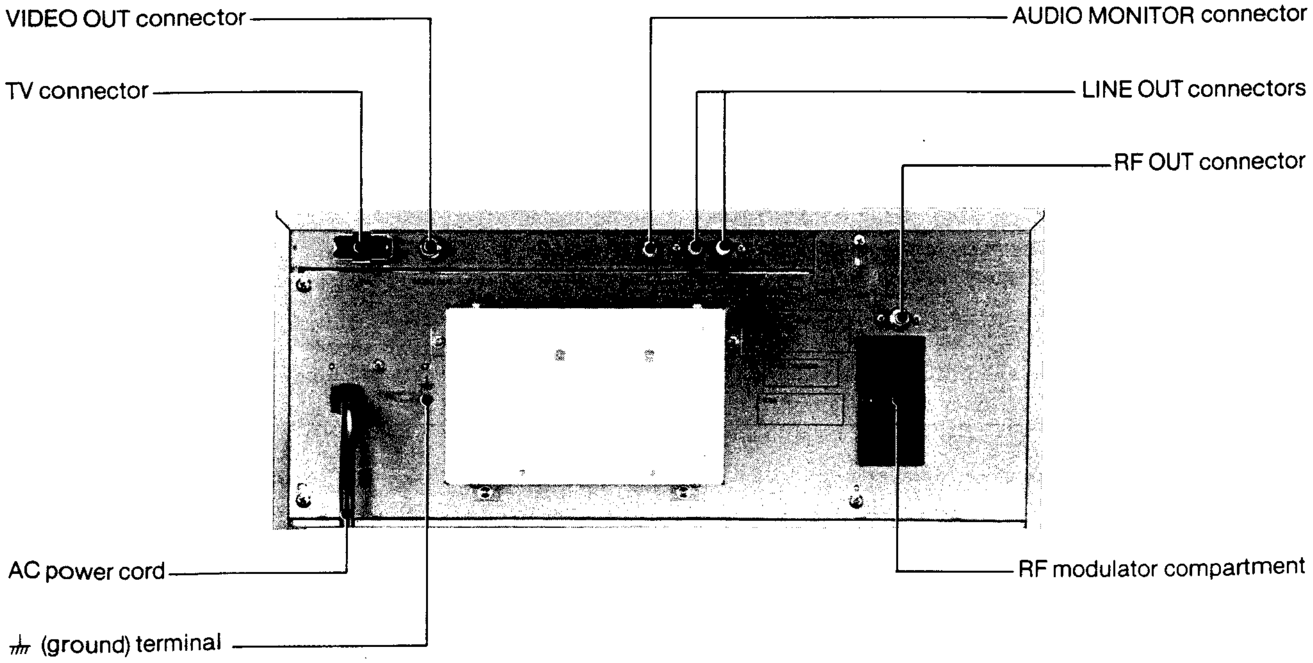
Compact and lightweight design
The machine is compact and lightweight so that it can easily be mounted into the rack and the space for setting the machine can be saved.

No power adaptation
Thanks to high efficiency switching regulator developed by Sony, the unit can be operated with a wide range of power voltages and frequencies without power adaptation.

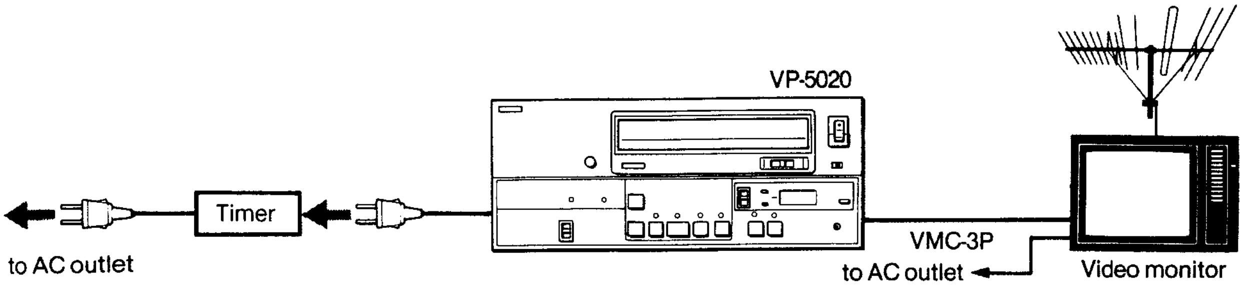
1-2. LOCATION AND FUNCTION OF PARTS AND CONTROLS


Cassette compartment
SKEW lever
TRACKING control
Power section
SONY
VIDEOCASSETTE PLAYER VP-5020
AUDIO MONITOR selector
REMOTE jack
Indicators
Memory counter section
Function buttons
SEARCH buttons

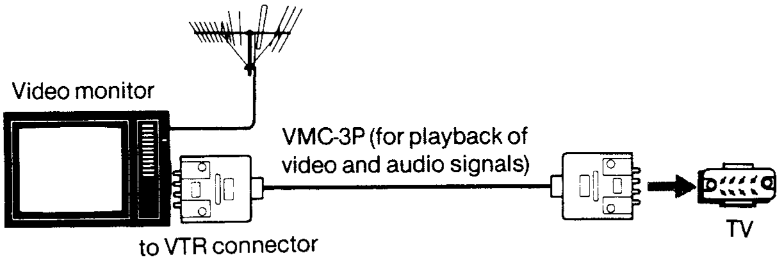
REAR PANEL


VIDEO OUT connector
AUDIO MONITOR connector
TV connector
LINE OUT connectors
RF OUT connector
AC power cord
RF modulator compartment
⏚ (ground) terminal

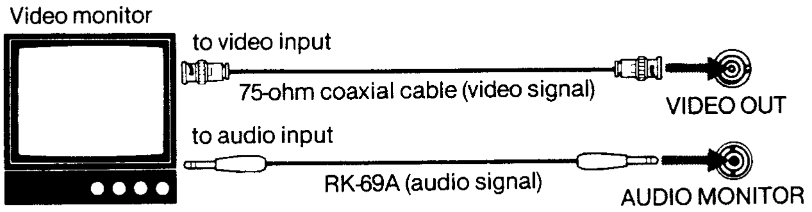
1-3. CONNECTION


VP-5020
Timer
to AC outlet
VMC-3P
to AC outlet
Video monitor

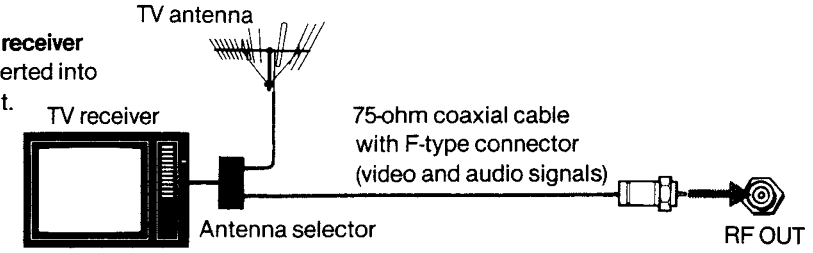
When the video monitor has an 8-pin VTR connector

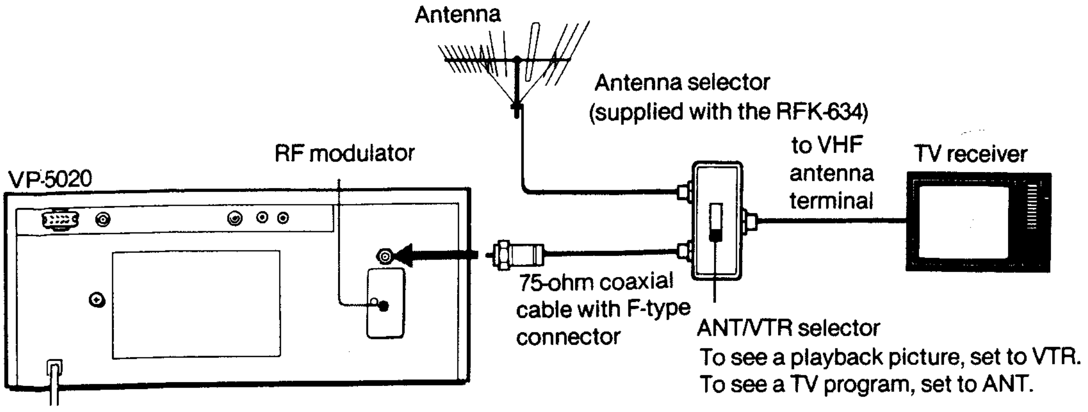

Video monitor
VMC-3P (for playback of video and audio signals)
to VTR connector
TV

When the video monitor does not have an 8-pin VTR connector


Video monitor
to video input
75-ohm coaxial cable (video signal)
VIDEO OUT
to audio input
RK-69A (audio signal)
AUDIO MONITOR

Playback on a conventional TV receiver
An RF modulator should be inserted into the RF modulator compartment.
- For details, see page 19.

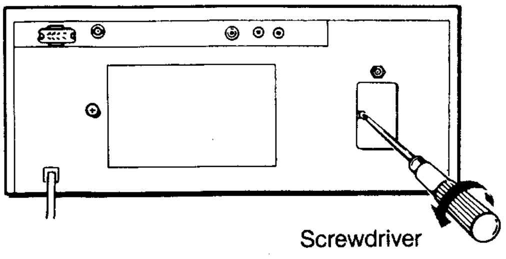

TV antenna
TV receiver
75-ohm coaxial cable with F-type connector (video and audio signals)
Antenna selector
RF OUT


Antenna
Antenna selector (supplied with the RFK-634)
RF modulator
VP-5020
to VHF antenna terminal
TV receiver
75-ohm coaxial cable with F-type connector
ANT/VTR selector

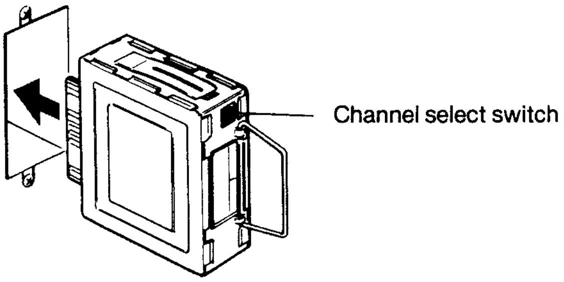
To see a playback picture, set to VTR.
To see a TV program, set to ANT.

1-4. INSTALLATION OF AN RF MODULATOR

1 Loosen the screw on the RF modulator compartment, and remove the lid.



2 Set the channel select switch on the RF modulator to the inactive channel in your area, channel 3 or 4.



3 Install the RF modulator into the compartment aligning the direction properly.

1-5. OPERATION

Panse Mode

Press the PAUSE button. The tape stops and a still picture will appear on the monitor screen.
To resume playback, press the PAUSE button again or press the PLAY button.

The long pause mode

If the pause mode continues for about 8 minutes, the tape around the head drum automatically slackens to protect the video heads and the tape, and the still picture disappears. This is called the long pause mode.

Search Operation

The SEARCH buttons allow you to view the playback picture at about 5-times normal speed in both forward and reverse directions so that a particular point can be quickly located.

Program Operation

Using the MARK IN A and B buttons and the PROGRAMMED OPERATION selector, you can locate a particular point quickly or play a particular portion repeatedly.

- You can memorize only one point on each MARK IN A or B button. If the button is pressed several times, only the last point will be memorized.
- The PROGRAMMED OPERATION selection should be set to the OFF or $\overset{A}{\rightarrow\mid\leftarrow}$ when you memorize the point on the MARK IN A or B button.
- The memory of the MARK IN A and B buttons are cancelled when the RESET button is pressed and the "00:00" will be memorized on both buttons.
- When the programmed operation is finished, be sure to set the PROGRAMMED OPERATION selector to OFF.

To Locate a Particular Point

1. Press the MARK IN A button at the desired point.
2. Set the PROGRAMMED OPERATION selector to $\overset{A}{\rightarrow\mid\leftarrow}$.
3. Run the tape in the rewind or search mode.

The tape will stop at the point where the MARK IN A button was pressed. When the tape runs in the search mode, a still picture can be seen when the tape stops.

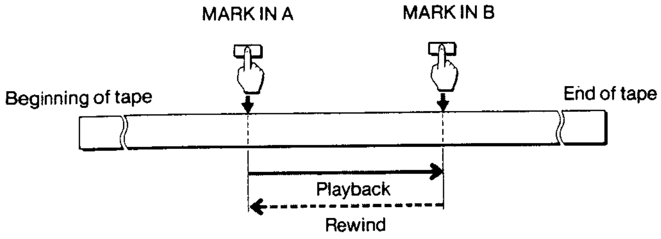
- If any point has not been memorized on the MARK IN A button, the tape stops at the point where the time counter indicates "00:00".

- When the REW button is pressed during playing the tape back, the point where the tape stops may slipped by about 3 seconds.

To Repeat a Particular Portion

1. Search for a point from where the playback is to begin, and press the MARK IN A button to memorize the point.
2. Search for a point where the playback is to stop, and press the MARK IN B button to memorize the point.
3. Set the PROGRAMMED OPERATION selector to $\overset{A}{\underset{B}{\circlearrowright}}$.
4. Press the REW button.
   The part between the points memorized on the MARK IN A and B buttons are played back repeatedly.

To stop the playback, press the STOP button.

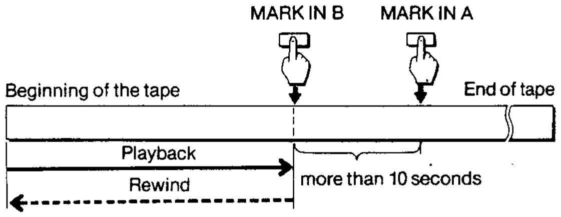


- The video signal or the CTL signal should be recorded for more than 5 second after the point which is memorized on the MARK IN B button.

To repeat between the beginning of the tape and a particular point

1. Search for a point where the playback is to stop and memorize the point on the MARK IN B button.
2. Play the tape for more than 10 seconds from the memorized point, stop the tape and press the MARK IN A button.
3. Set the PROGRAMMED OPERATION selector to $\overset{A}{\underset{B}{\circlearrowright}}$.
4. Press the REW button.
   The tape rewinds to the beginning of the tape, then the player plays back the designated portion on the tape repeatedly.

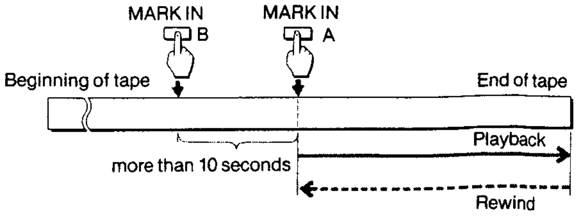
To stop the playback, press the STOP button.



To repeat between a particular point and the end of the tape

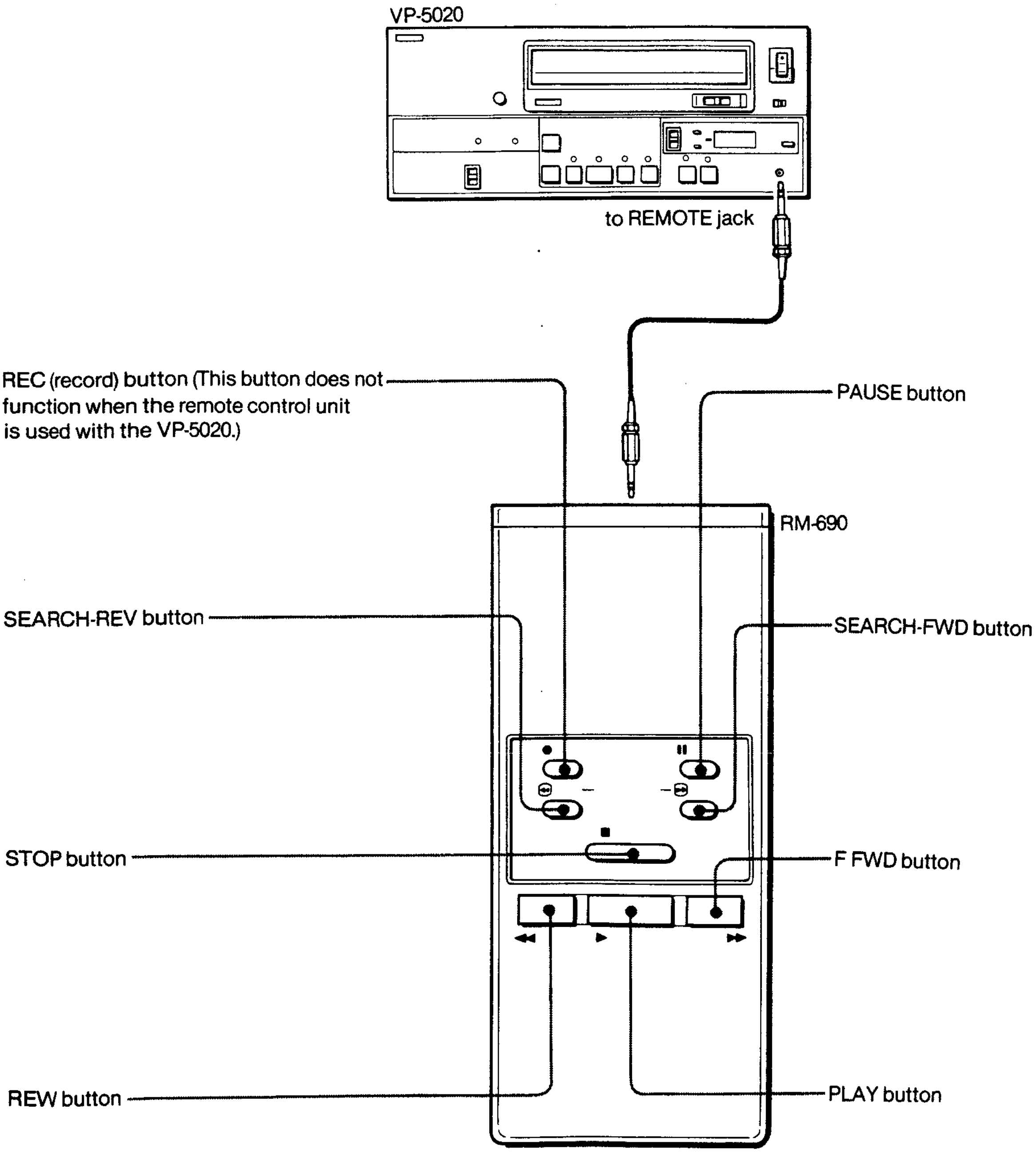
1. Search for a point from where the playback is to begin and press the MARK IN A button.
2. Rewind the tape more than 10 seconds by watching the time counter, stop the tape and press the MARK IN B button.
3. Set the PROGRAMMED OPERATION selector to $\overset{A}{\underset{B}{\circlearrowright}}$.
4. Play the tape.
   The tape is played back to the end and rewinds to the point where the MARK IN A button was pressed, and the playback of the designated portion on the tape is repeated.

To stop the playback, press the STOP button.



1-6. REMOTE CONTROL

The VP-5020 can be controlled by a remote control unit RM-690 (optional) connected to the REMOTE jack. The function of the buttons of the RM-690 is the same as that of the VP-5020.


VP-5020
to REMOTE jack
REC (record) button (This button does not function when the remote control unit is used with the VP-5020.)
PAUSE button
RM-690
SEARCH-REV button
SEARCH-FWD button
STOP button
F FWD button
REW button
PLAY button

2-3. PRINTED CIRCUIT BOARD

Circuit information is provided below.

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	VA-35	Video Demodulator
AUDIO	AH-11	Audio PB Head
	VA-35	Audio PB Amplifier
SERVO	AH-11	CTL PB Head
	EC-23	FR CTL PB Head
	PT-9	Reel Motor Driver
	SV-74	Drum / Capstan Servo
POWER	AC-65	AC Input
	DC-24	DC Supply / Fuse
	UR-14	Switching Regulator
KEY	KY-91	Function Key / Display
SYSTEM CONTROL	PD-29	Pinch, S-idler, S-brake, Search, Skew Solenoid
	PD-30	T-idler, T-brake Solenoid
	PH-5	Tape Beginning / End Detector
	SY-51	System Control
OTHERS	CC-22	Cassette Compartment Switch / Motor
	CC-23	
	CC-24	
	LM-13	Threading Motor
	PTC-16	S-reel Rotation Detector
	PTC-17	Threading Ring Detector
	RM-39	Reel Motor
	SE-46	Tension Regulator
	PTC-16	T-reel Rotation Detector
	SW-50	FR Unthread End Detector
	TG-22	Tension Regulator LED

2-4. CONNECTION CONNECTOR

When external cables are connected to the various connectors on the connector panel during maintenance, the hardware listed below (or equivalents) must be used.

Panel indication	Connection connector
VIDEO OUT	1-560-069-11 PLUG, BNC, MALE
RF OUT	1-506-305-00 PLUG, F
MONITOR	1-506-161-00 CONNECTOR, 8P, MALE

2-5. OUTPUT SIGNAL OF THE CONNECTOR

OUTPUT

VIDEO OUT : 1.0 ± 0.2 Vp-p,
75 ohms, unbalanced,
sync negative
AUDIO LINE OUT CH-1, CH-2
: -5.0 dB (47-kohm load)
AUDIO MONITOR : -5.0 dB (47-kohm load)

2-6. SPARE PARTS

(1) The shaded and ⚠ -marked components are critical to safety.
Replace only with the same components as specified.

(2) Replacement parts supplied from the Sony Parts Center will sometimes have a different shape and outside view from the parts which are used in the unit. This is due to "accommodating improved parts and/or engineering changes" or "standardization of genuine parts".

- This manual's exploded views and electrical spare parts lists indicate the part numbers of "the present standardized genuine parts".
- Regarding engineering part changes by our engineering department, refer to Sony service bulletins and service manual supplements.

(3) The parts marked with "s" in the SP column of the exploded views and electrical spare parts lists are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

2-7. SELECT SWITCH SETTING

Along with the select switches on the control panel and the connector panel, the switch listed below is on the SY-51 Board. This switch must be set according to operating conditions.

. SY-51 Board

SW1 : SELF DIAGNOSTIC Switch
ON : SELF DIAGNOSTIC mode
OFF : NORMAL mode
When the unit is shipped, this switch is set to the OFF position.

2-8. HOW TO OPERATE THE MACHINE WITHOUT INSTALLING A CASSETTE TAPE

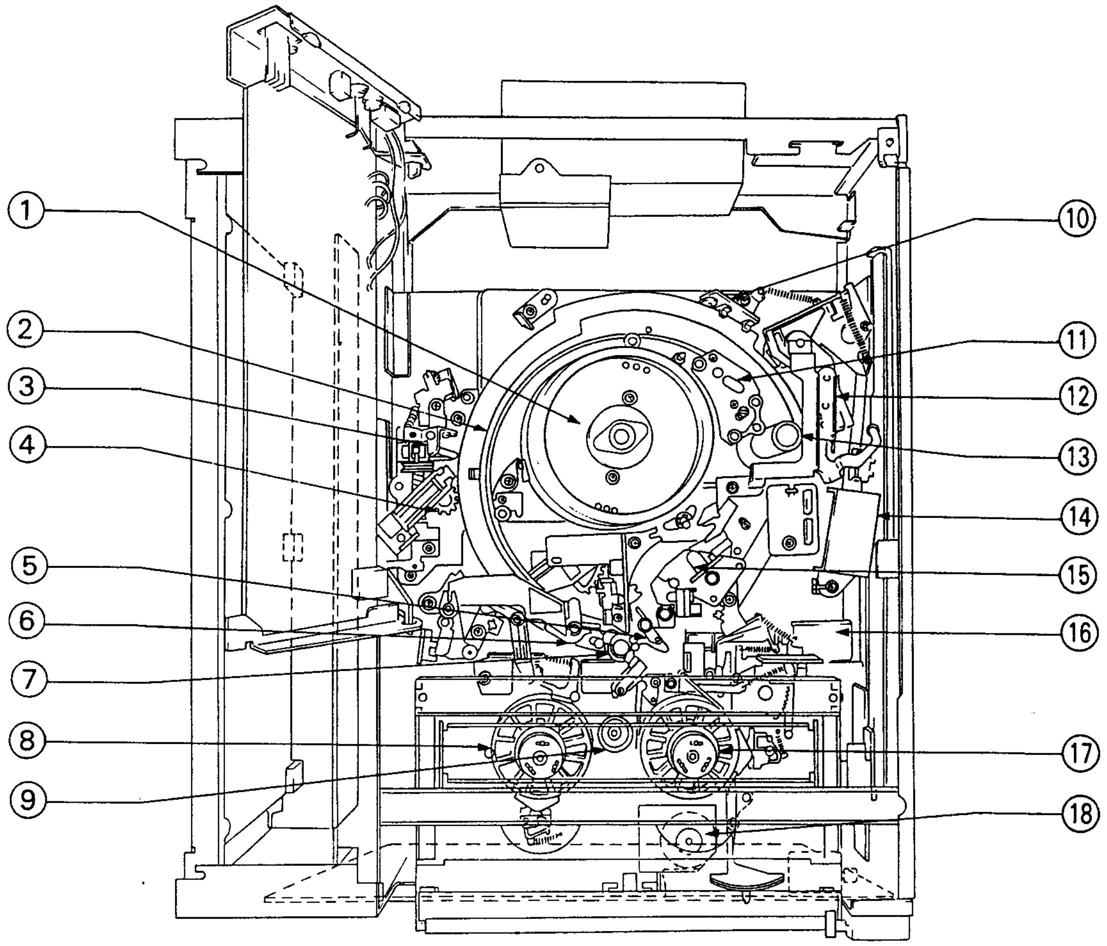
(1) Remove the Cassette-up Compartment. (Refer to Section 2-1.)
(The Tape Beginning Sensor and Tape End Sensor are disabled according to disconnect the connector of Cassette-up Compartment.)

(2) Turn the power ON. (The machine enters the FR-STOP mode automatically.)

(3) The machine can be placed into the desired mode by pressing the function button corresponding to the mode.

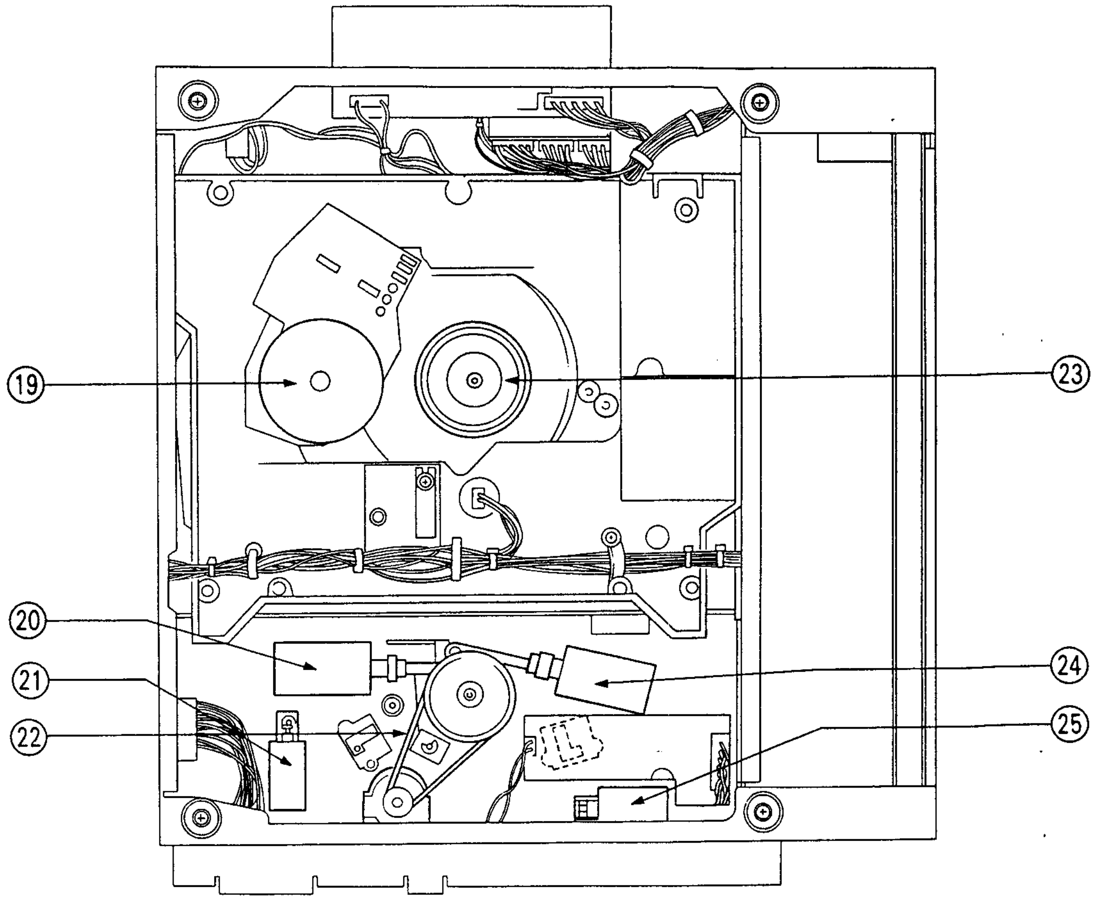
2-2-2. Location of the Main Mechanical Parts/Components

<TOP VIEW>



1 Head Drum
2 Threading Ring
3 T Correction Guide
4 Gear Box
5 S Drawer Arm
6 T Drawer Arm
7 Pinch Roller
8 Take-up Reel Table
9 FF/REW Idler
10 FR Detector
11 Audio/CTL Head
12 Pinch Lever
13 Capstan Shaft
14 Pinch Solenoid
15 CTL PB Head
16 Search Solenoid
17 Supply Reel Table
18 Reel Motor

<BOTTOM VIEW>

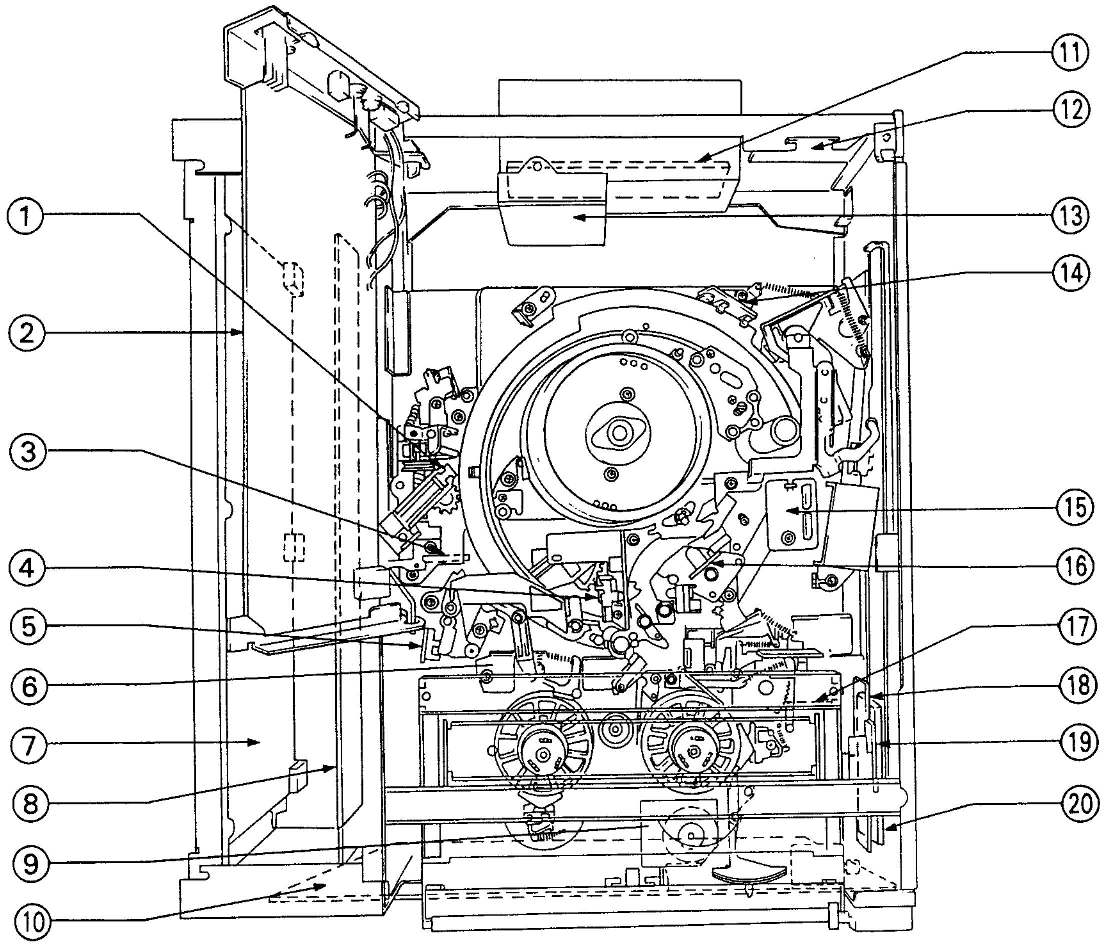


19 Capstan Motor
20 Supply Idler Solenoid
21 Supply Brake Solenoid
22 Belt for FF/REW Idler
23 Drum Motor
24 Take-up Idler Solenoid
25 Take-up Brake Solenoid

2-2. MAIN PARTS LOCATION

2-2-1. Location of the Printed Circuit Boards

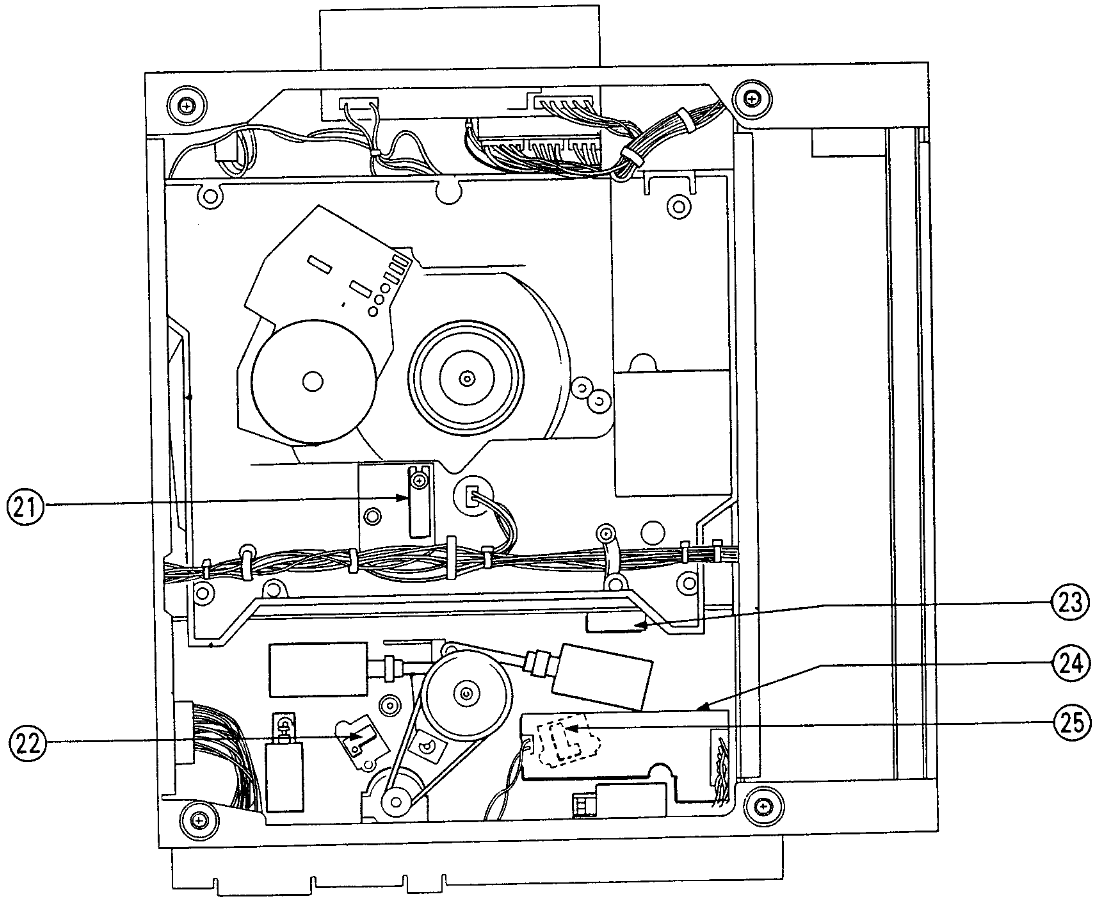
<TOP VIEW>



1 PH-5 Board
2 VA-35 Board
3 LM-13 Board
4 PH-5 Board
5 SW-50 Board
6 SE-46 Board
7 SV-74 Board
8 SY-51 Board
9 RM-39 Board
10 KY-91 Board

11 UR-14
12 AC-65 Board
13 DC-24 Board
14 PTC-17 Board
15 AH-11 Board
16 EC-23 Board
17 CC-23 Board
18 CC-22 Board
19 CC-24 Board
20 PD-29 Board

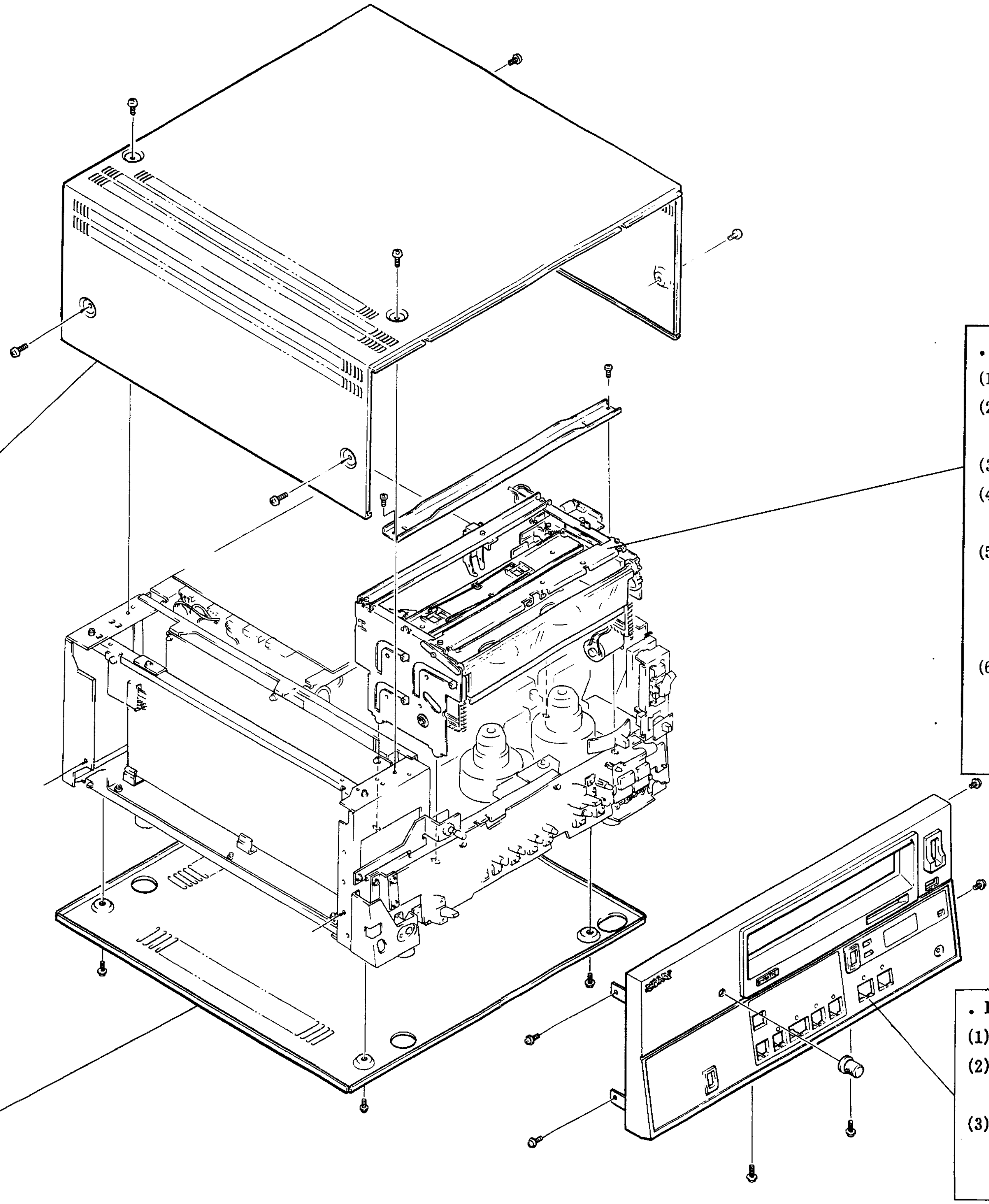
<BOTTOM VIEW>



21 PT-9 Board
22 PTC-16 Board
23 TG-22 Board
24 PD-30 Board
25 PTC-16 Board

SECTION 2
SERVICE INFORMATION

2-1. REMOVAL OF CABINET



. Upper Case

(1) Remove the six fixing screws shown in the figure. Then remove the Upper Case from the unit.

. Lower Case

(1) Remove the four fixing screws. Then remove the Lower Case from the unit.

. Cassette-up Compartment

(1) Remove the Upper Case.

(2) Remove the two fixing screws and then remove the bracket.

(3) Disconnect CN1 on the CC-22 Board.

(4) Lift the Cassette-up Compartment Block slowly.

(5) When installing the Cassette-up Compartment, insert the projections of the Cassette-up Compartment Block into the holes of the chassis.

(6) Insert the projections of the Cassette-up Compartment Block into the holes of the bracket (as shown in the figure) and then fasten the screws.

. Front Panel

(1) Remove the Upper Case.

(2) Remove the six fixing screws (two screws each on the left and right sides and the bottom).

(3) Loosen the two fixing screws shown in the figure. Then remove the Front Panel from the unit.

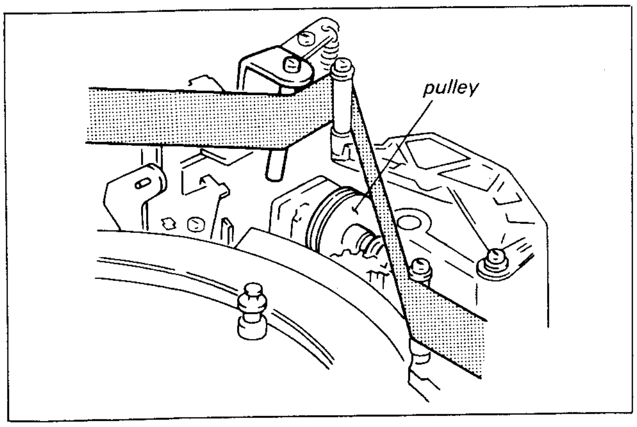
2-9. CASSETTE REMOVAL PROCEDURE WHEN NORMAL EJECTION IS NOT POSSIBLE

If the EJECT operation becomes impossible due to trouble or the Cassette-up Compartment does not rise when the EJECT operation takes place, the cassette tape can be removed from the set by following the procedures described below.

(1) Turn the power OFF.

(2) Remove the Upper Case.
(Refer to Section 2-1.)

(3) Turn the white pulley of the Gear Box by hand in a clockwise direction until the Threading Ring is in the FR-STOP position. (The Threading Ring moves in the unthreading direction. But the tape remains at the position of threading completion.)

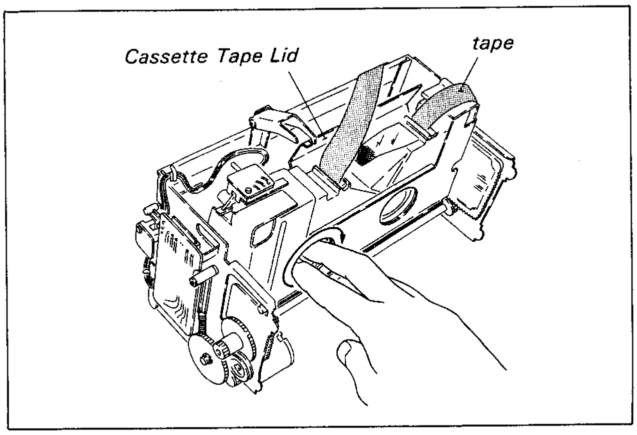


(4) Disconnect the connector CN1 on the CC-22 Board of the Cassette-up Compartment.

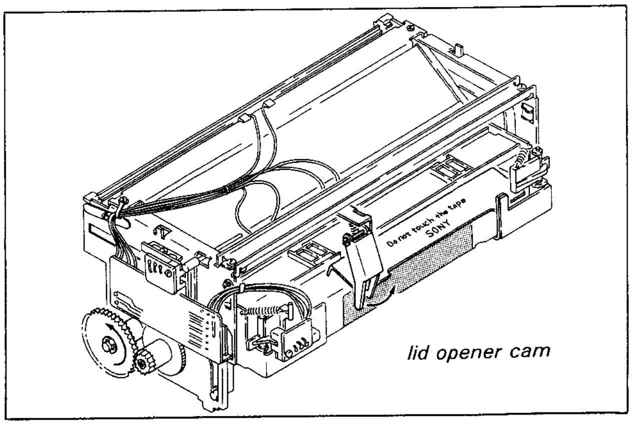
(5) Remove the bracket. (Refer to Section 2-1.)

(6) Slowly lift the Cassette-up Compartment with the cassette tape in it. Remove the tape remaining in the set carefully so that it is not damaged.

(7) Hold the Cassette Tape Lid so that it does not close. Wind the tape into the cassette by turning the reel hub on the back of the cassette by hand.



(8) Raise the cam for opening the lid and close the cassette tape lid.



(9) Remove the tape from the Cassette-up Compartment.

(10) Turn the gear on the right side of the Cassette-up Compartment by hand in a counterclockwise direction in order to place the Cassette-up Compartment into the up-state.

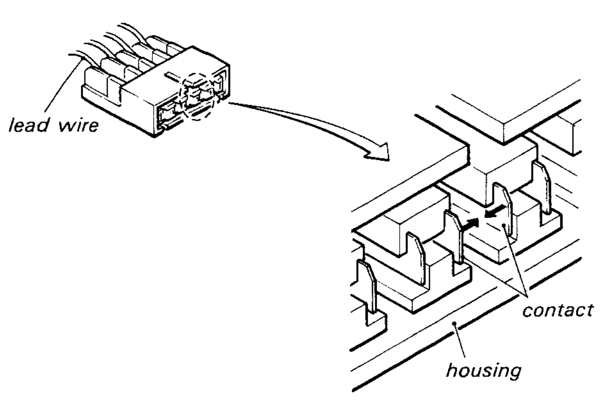
(11) Locate the cause of the trouble and remedy the problem.

2-10. REPLACEMENT PROCEDURE OF CONTACT FOR THE BOARD CONNECTOR

The connector for the printed circuit board is composed of the receptacle and plug. The plug consists of contacts and a housing.
The housing holds the contacts which are connected to a harness. The replacement procedure for the contacts is as follows:

Replacement procedure:

1. Bend the claws of the contact in the direction of the arrows so that the lock disengages.
2. Pull the lead wire connected to the contact.
3. Replace the contact with a new one.
4. Install the contact into the housing.



2-11. DIAGNOSTIC FUNCTION IN SYSTEM CONTROLLER

2-11-1. Outline of Self Diagnosis

The VP-5020 has a self diagnostic function for the system control circuit which determines if the source of the problem is in the microcomputer itself or not.
The system control function is classified into mechanical and electrical operation controls. Mechanical operation control defects are efficiently analyzed using the self diagnostic function.
The VP-5020 employs five one-chip microcomputers, two of which are used for system control of the VTR. The diagnostic function enables the input and output data of the two microcomputers to be latched using another microcomputer for display and the diagnostic result to be displayed on LEDs on the front panel. The microcomputer operation is determined by each input signal, and the malfunctions can be detected by checking the input and output signals.

2-11-2. Diagnosis Method

When switch SW1 on the SY-51 Board is set to ON, the self diagnostic function is activated. For the diagnostic result display, the input and output data of the microcomputer's I/O port is displayed four bits at a time for each test address, as shown on pages 2-12 through 2-14.
When the RESET button is pressed, the test address is displayed. When the MARK A button is pressed while the RESET button is pressed, the low order digit of the test address is changed as shown below.

→ 0 → 1 → 2 → ··· → 9 → L → H → P → R → -(minus) → (blank)

When the MARK B button is pressed while the RESET button is pressed, the high order digit of the test address is changed as shown below.

→ 0 → 1 → 2

Twenty six test addresses are available in hexadecimal notation. Therefore, when the RESET, MARK A, and MARK B buttons are pressed, any test address data (digits 1 through 4) shown in the table on pages 2-12 through 2-14 can be displayed on the front panel LEDs. For the LED display, logic "H" or "L" is displayed by "1" or "0" and changed, depending on the VTR operating condition.
For example: To observe an H:DRUM STOP signal in test address "01", the following operation is performed.

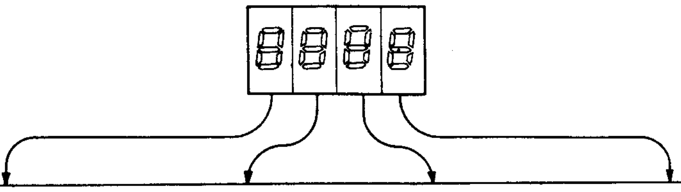
Operation	LED display CTL display	Remarks
	↓	
Turn SW1 on the SY-51 Board ON.	1100	Enters the diagnosis mode.
	↓	
Press the RESET button.	00	Test address = 00
	↓	
Press the MARK A button one time while pressing the RESET button.	01	Test address = 01
	↓	
Release the RESET button.	1111	Data in test address 01
	↑	
	H:DRUM STOP signal	

If the head drum is stopped, the leftmost digit displays "H" ("1"). When a cassette tape is inserted into the VTR and the PLAY mode is entered, display "1" is changed to "0" (rotation command).
The input and output signals of the microcomputer in each mode are shown in the timing chart on pages 2-17 through 2-32. If an input signal is properly sent to the microcomputer in each mode, the microcomputer sends an output signal shown in the timing chart.

2-11-3. Troubleshooting

The troubleshooting employing the diagnosis function is described here.
The mode conversion diagram of the mechanical operation is shown on page 2-15. Referering to this diagram, check where the present trouble occurs during mode conversion, or where malfunctions are found during mechanism (e.g., motor or solenoid) operation. When the mode in which the trouble occurs is detected, refer to the timing chart described in the mode conversion diagram. The timing chart shows the input and output signals of the microcomputer in each mode. Therefore, when the motor or solenoid is abnormal, observe the output signal line using an LED to check whether it is changed as shown in the timing chart. When the output signal from the microcomputer is normal, check the input signal to the microcomputer. If the signal line is not changed as shown in the timing chart, refer to the schematic diagram for the trouble location. The timing chart lists an input/output signal name, signal display test address and digit, and the microcomputer pin name through which a signal is input and output.
For example, the H:DRUM STOP signal is displayed in the leftmost digit (digit 1) when the test address is "01". Whether the input and output signals are changed as shown in the timing chart is checked with the actual VTR operation.

2-11-4. Diagnosis List



TEST ADDRESS	DATA DISPLAYED				INPUT/OUTPUT PORT NAME ON THE MICRO PROCESSOR	
	DIGIT 1	DIGIT 2	DIGIT 3	DIGIT 4		
00	CAPSTAN CMD FWD/$\overline{\text{REV}}$ 1=FWD CMD 0=REV CMD	NORMAL/$\overline{\text{SEARCH}}$ 1=NORMAL 0=SEARCH MODE	0	0	E1	OUT/IC7 on SY-51
01	H : DRUM STOP CMD 1=DRUM STOP 0=DRUM ROTATE	1	1	1	E2	OUT/IC7 on SY-51
02	CTL COUNT UP/$\overline{\text{DOWN}}$ 1=COUNT UP 0=COUNT DOWN	1	1	1	E3	OUT/IC7 on SY-51
03	H : REEL REV 1=SEARCH REV MODE	H : REEL FWD 1=PLAY or SEARCH FWD MODE	H : REEL STILL 1=PLAY PAUSE or SEARCH PAUSE	H : REEL STOP 1=STOP MODE	P	OUT/IC7 on SY-51
04	H : REEL FF/REW 1=FF or REW MODE 0=other mode	L : SEARCH SOL.ON 1=OFF 0=ON	L : PINCH SOL.ON 1=OFF 0=ON	1	O	OUT/IC7 on SY-51
05	L : T-BRAKE SOL.ON 1=OFF 0=ON	L : S-BRAKE SOL.ON 1=OFF 0=ON	L : T-IDLER SOL.ON 1=OFF 0=ON	L : S-IDLER SOL.ON 1=OFF 0=ON	E0	OUT/IC7 on SY-51
06	SEARCH SPEED DATA (NOTE 1)				R2	OUT/IC7 on SY-51
07	L : CASSETTE COMPARTMENT UP CMD 0=UP	L : CASSETTE COMPARTMENT DOWN CMD 0=DOWN	L : THREAD MOTOR ON 0=THREAD	L : UNTHREAD MOTOR ON 0=UNTHREAD	R3	OUT/IC7 on SY-51
08	0	L : FR-UNTHREAD POSITION	H : CASSETTE DOWN 1=DOWN (NOTE 2)	H : CASSETTE IN 1=INSERTED	K	IN/IC7 on SY-51
09	H : DRUM STOP 1=STOP 0=ROTATE	H : REEL STOP 1=STOP 0=ROTATE	H : T-IDLER ON 1=ON 0=OFF	H : T-REEL STOP 1=STOP 0=ROTATE		
OL	L : CAPSTAN STOP 1=ROTATE 0=STOP	CAPSTAN FWD/$\overline{\text{REV}}$ 1=FWD 0=REV	UNTHREAD END (NOTE 3)	THREAD END	R1	IN/IC7 on SY-51
OH	0	0	PAUSE SELECT-1 0 (NOTE 4)	PAUSE SELECT-0 1	E4	IN/IC7 on SY-51
OP	L : DRUM ROTATE 1=STOP 0=ROTATE	L : CASSETTE CONNECT 0	L : SLACK DET : OFF (NOTE 5)	0	E5	IN/IC7 on SY-51
OR	RING SLACK ERROR MASSAGE (NOTE 6) The condition of the VP-5020 is detected by IC7/SY-51 board when ring slack occurs. RING SLACK means that the threading ring does not rotate.					
0-	0	0	0	0		
O (Blank)	0	0	0	0		

10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	REMOTE CONTROL CODE FROM RM-690 (NOTE 8)			
19	1	1	1	1
1L	1	1	1	1
1H	1	1	1	1
1P	1	1	1	1
1R	1	1	1	1
1-	1	1	1	1
1 (Blank)	1	1	1	1
20	REEL SLACK ERROR MASSAGE (NOTE 7) The condition of the VP-5020 is detected by IC12/SY-51 board When reel slack occurs. REEL SLACK means that the reel motor does not rotate.			
21	0	0	0	0
22	0	0	0	0

23	0	0	L : VIDEO MUTE (1=VIDEO is OUTPUT (0=VIDEO is MUTED	H : AUDIO MUTE (1=AUDIO is MUTE (0=AUDIO is OUTPUT
24	1	0	0	0
25	0	0	0	0
26	0	0	0	0

NOTE 1 SEARCH SPEED DATA

DATA DISPLAYED	TAPE SPEED
0 0 0 0	NOISE LESS STILL
0 1 0 1	x 1
0 1 1 1	x 5
1 0 0 1	STILL

NOTE 2 CASSETTE IN/CASSETTE DOWN

H:CASSETTE IN	H:CASSETTE DOWN	CASSETTE POSITION
0	0	During CASSETTE-IN
0	1	CASSETTE-UP completely
1	0	During CASSETTE-DOWN
1	1	CASSETTE-DOWN completely

NOTE 3 THREAD END/UNTHREAD END

UNTHREAD END	THREAD END	THREADING RING POSITION
1	1	Between CASSETTE-IN and FR-STOP
0	1	THREAD END position
0	0	Between FR-STOP and THREAD END
1	0	FR-STOP position

NOTE 4 PAUSE SELECT-1/PAUSE SELECT-0

PAUSE SELECT-1	PAUSE SELECT-0	PAUSE TIMER
0	1	8 min
1	1	1 min
1	0	10 sec
0	0	2 sec

NOTE 5 SLACK DETECT

- While shorting between TP 3 and GND(E1) on the SY-51 Board, The SLACK Detector does not operate.
  The Normal state is "H".

NOTE 8 REMOTE CONTROL CODE

COMMAND	CODE	COMMAND	CODE
STOP	1 0 0 0	FWD SEARCH	0 1 1 0
FF	1 1 0 0	REV SEARCH	0 1 1 1
REW	1 0 1 1	PAUSE	1 0 0 1
PLAY	1 0 1 0	REC	1 1 1 0

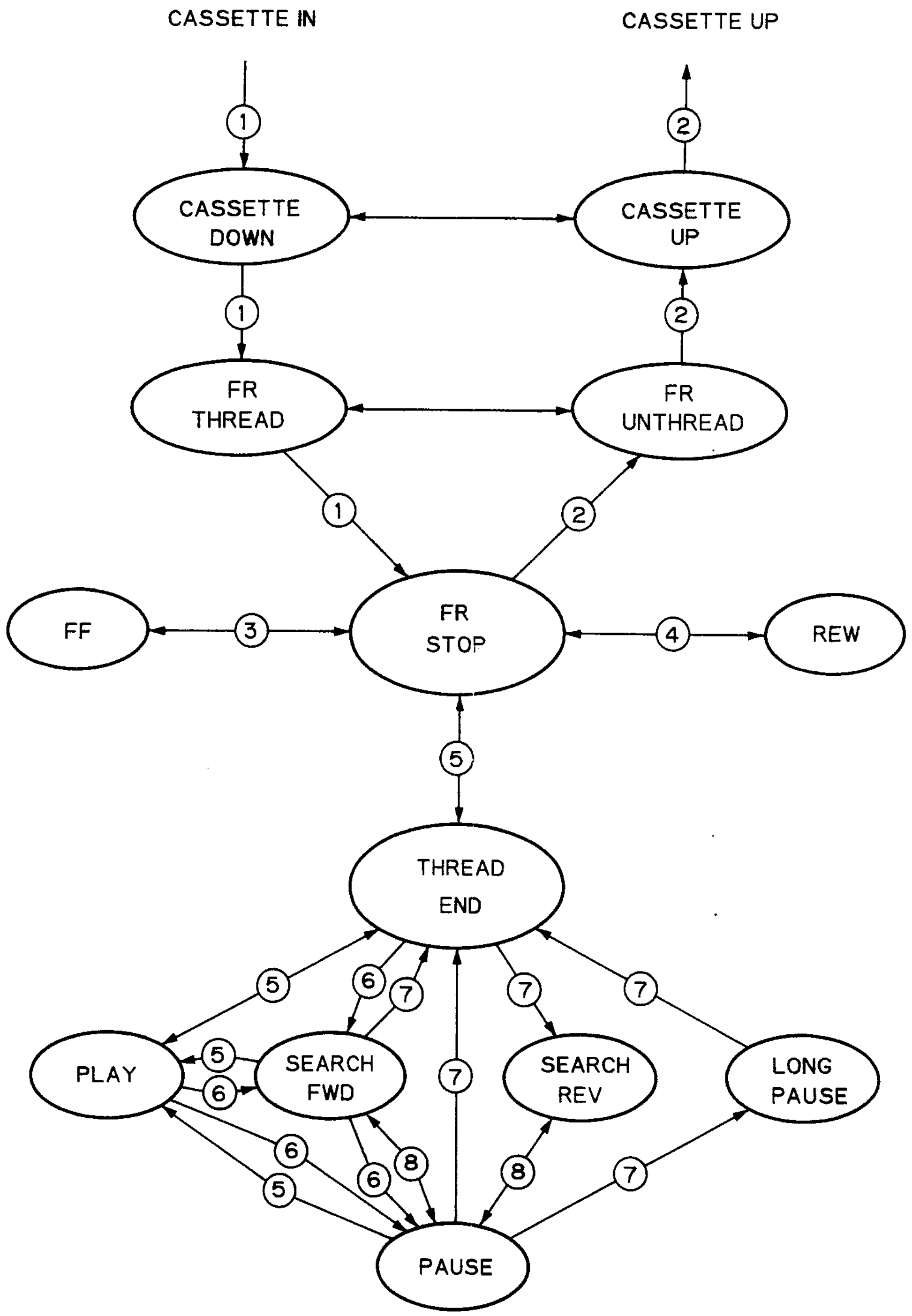
NOTE 6 RING SLACK ERROR MASSAGE

DATA DISPLAYED	CONDITION
0 0 0 0	RING SLACK does not occur
0 0 0 1	CASSETTE DOWN → FR-STOP
0 0 1 0	FR-STOP → THREAD END
0 0 1 1	THREAD END → FR-STOP
0 1 0 0	FR-STOP → CASSETTE DOWN
0 1 0 1	FR-STOP → CASSE

NOTE 7 REEL SLACK ERROR MASSAGE

DATA DISPLAYED	CONDITION
0 0 0 0	REEL SLACK does not occur
0 1 1 0	FF or REW mode
0 1 1 1	FR-STOP → FR UNTHREAD
1 0 0 0	x1 NORMAL SPEED or less
1 0 0 1	Hiqber than x1 NORMAL SPEED
1 0 1 0	THREAD END → FR-STOP

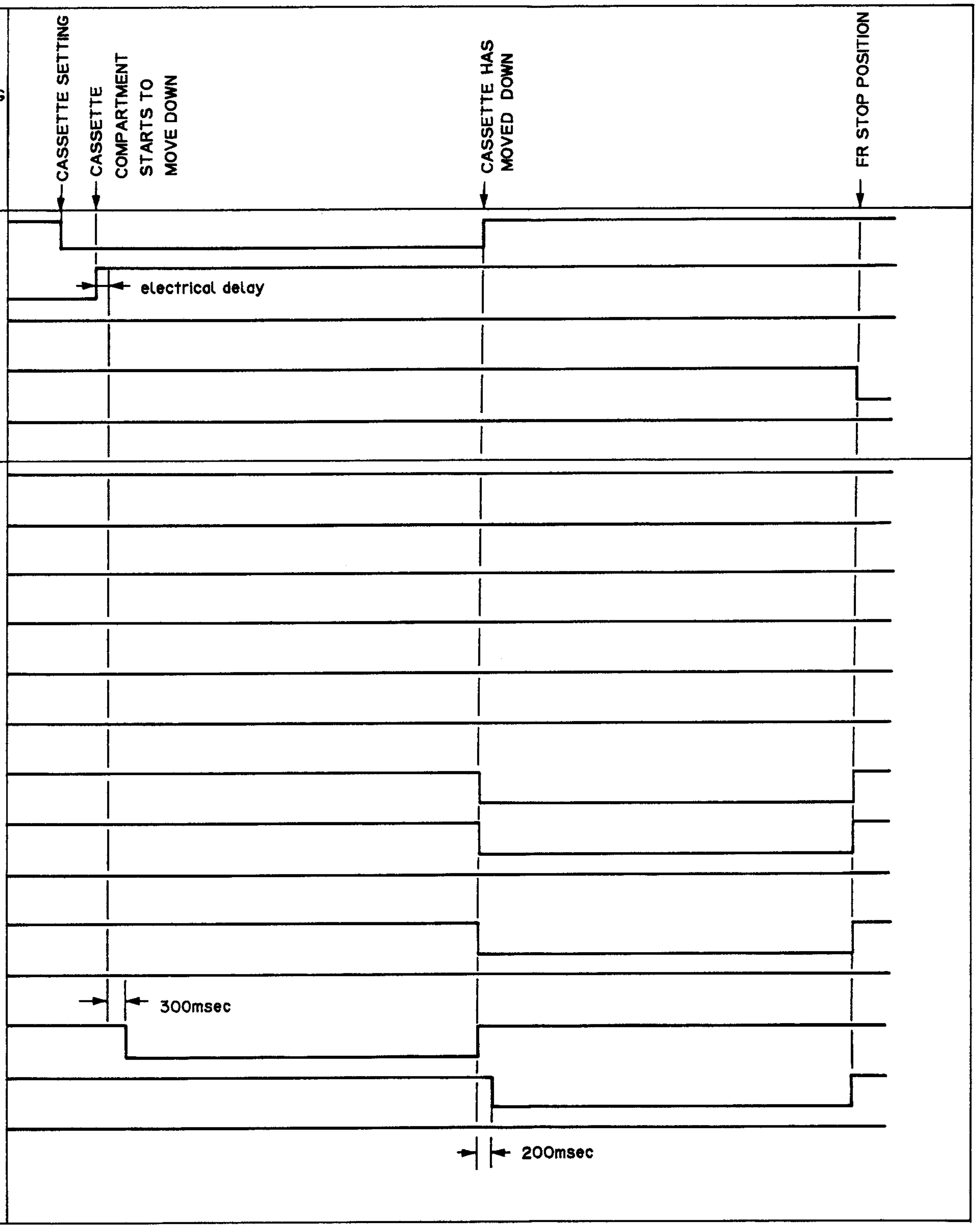
2-11-5. Mode Conversion Diagram and Timing Chart


CASSETTE IN
CASSETTE UP
CASSETTE DOWN
CASSETTE UP
FR THREAD
FR UNTHREAD
FF
FR STOP
REW
THREAD END
PLAY
SEARCH FWD
SEARCH REV
LONG PAUSE
PAUSE
1
2
3
4
5
6
7
8

NOTE: The number in the figure indicates the title number of the Timing chart (page 2-17 through 2-32).

1. THREADING OPERATION (CASSETTE IN→CASSETTE DOWN→FR STOP POSITION)

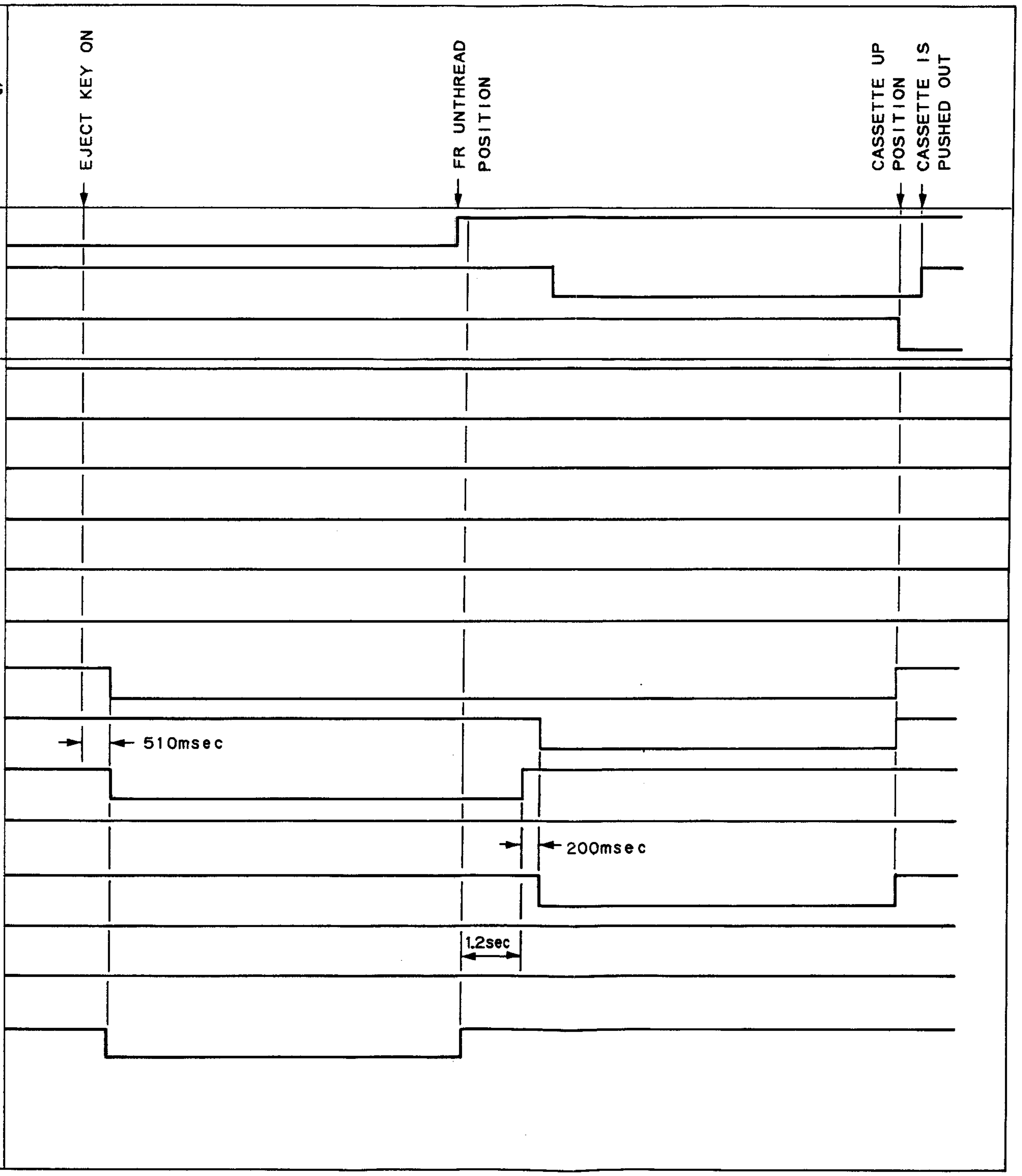
	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	H : CASSETTE DOWN	08 — DIGIT 3	IC7-18
	H : CASSETTE IN	08 — DIGIT 4	IC7-17
	L : THREAD END	0L — DIGIT 3	IC7-5
	L : UNTHREAD END	0L — DIGIT 4	IC7-6
	L : DEW DET	14 — DIGIT 3	(IC1-35 KY-91)
OUTPUT	FWD / $\overline{\text{REV}}$	00 — DIGIT 1	IC7-41
	NORMAL / $\overline{\text{SEARCH}}$	00 — DIGIT 2	IC7-40
	H : DRUM STOP	01 — DIGIT 1	IC7-45
	L : SKEW SOL,ON	02 — DIGIT 2	IC7-48
	L : SEARCH SOL,ON	04 — DIGIT 2	IC7-23
	L : PINCH SOL,ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL,ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL,ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL,ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL,ON	05 — DIGIT 4	IC7-34
	L : C,C, UP	07 — DIGIT 1	IC7-16
	L : C,C, DOWN	07 — DIGIT 2	IC7-15
	L : THREAD MOTOR ON	07 — DIGIT 3	IC7-13
	L : UNTHREAD MOTOR ON	07 — DIGIT 4	IC7-14
			ON SY-51 BOARD


CASSETTE SETTING
CASSETTE COMPARTMENT STARTS TO MOVE DOWN
CASSETTE HAS MOVED DOWN
FR STOP POSITION
electrical delay
300msec
200msec

C.C. = CASSETTE UP COMPARTMENT

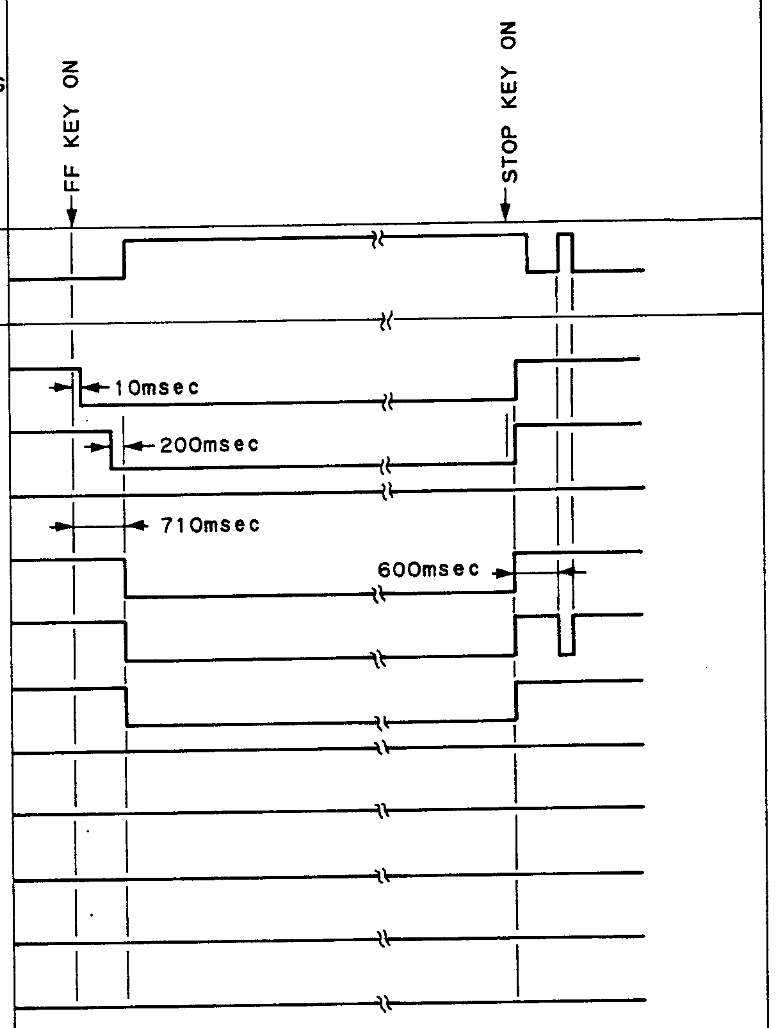
2. UNTHREADING OPERATION (FR STOP POSITION→FR UNTHREAD END POSITION→CASSETTE UP)

	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	L : FR UNTHREAD END	08 — DIGIT 2	IC7-19
	H : CASSETTE DOWN	08 — DIGIT 3	IC7-18
	H : CASSETTE IN	08 — DIGIT 4	IC7-17
OUTPUT	FWD / $\overline{\text{REV}}$	00 — DIGIT 1	IC7-41
	NORMAL / $\overline{\text{SEARCH}}$	00 — DIGIT 2	IC7-40
	H : DRUM STOP	01 — DIGIT 1	IC7-45
	L : SKEW SOL.ON	02 — DIGIT 2	IC7-48
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : PINCH SOL.ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
	L : C.C.UP	07 — DIGIT 1	IC7-16
	L : C.C.DOWN	07 — DIGIT 2	IC7-15
	L : THREAD MOTOR ON	07 — DIGIT 3	IC7-13
	L : UNTHREAD MOTOR ON	07 — DIGIT 4	IC7-14
			ON SY-51 BOARD


EJECT KEY ON
FR UNTHREAD POSITION
CASSETTE UP POSITION
CASSETTE IS PUSHED OUT
510msec
200msec
1.2sec

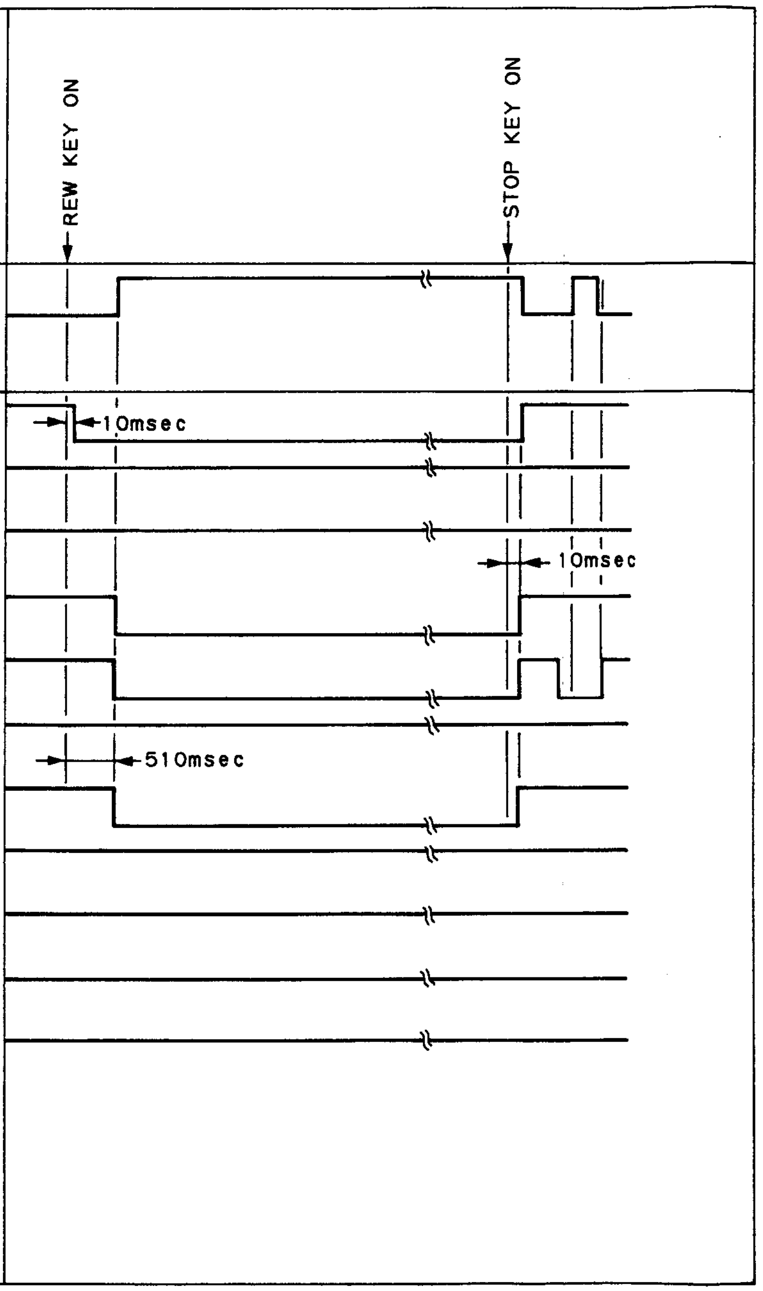
3. FF MODE (FR STOP→FF→FR STOP)

	SIGNRL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	L : REEL STOP	09 — DIGIT 2	
OUTPUT	H : DRUM STOP	01 — DIGIT 1	IC7-45
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : PINCH SOL.ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
	L : C.C.UP	07 — DIGIT 1	IC7-16
	L : C.C.DOWN	07 — DIGIT 2	IC7-15
	L : THREAD MOTOR ON	07 — DIGIT 3	IC7-13
	L : UNTHREAD MOTOR ON	07 — DIGIT 4	IC7-14
			ON SY-51 BOARD


FF KEY ON
STOP KEY ON
10msec
200msec
710msec
600msec

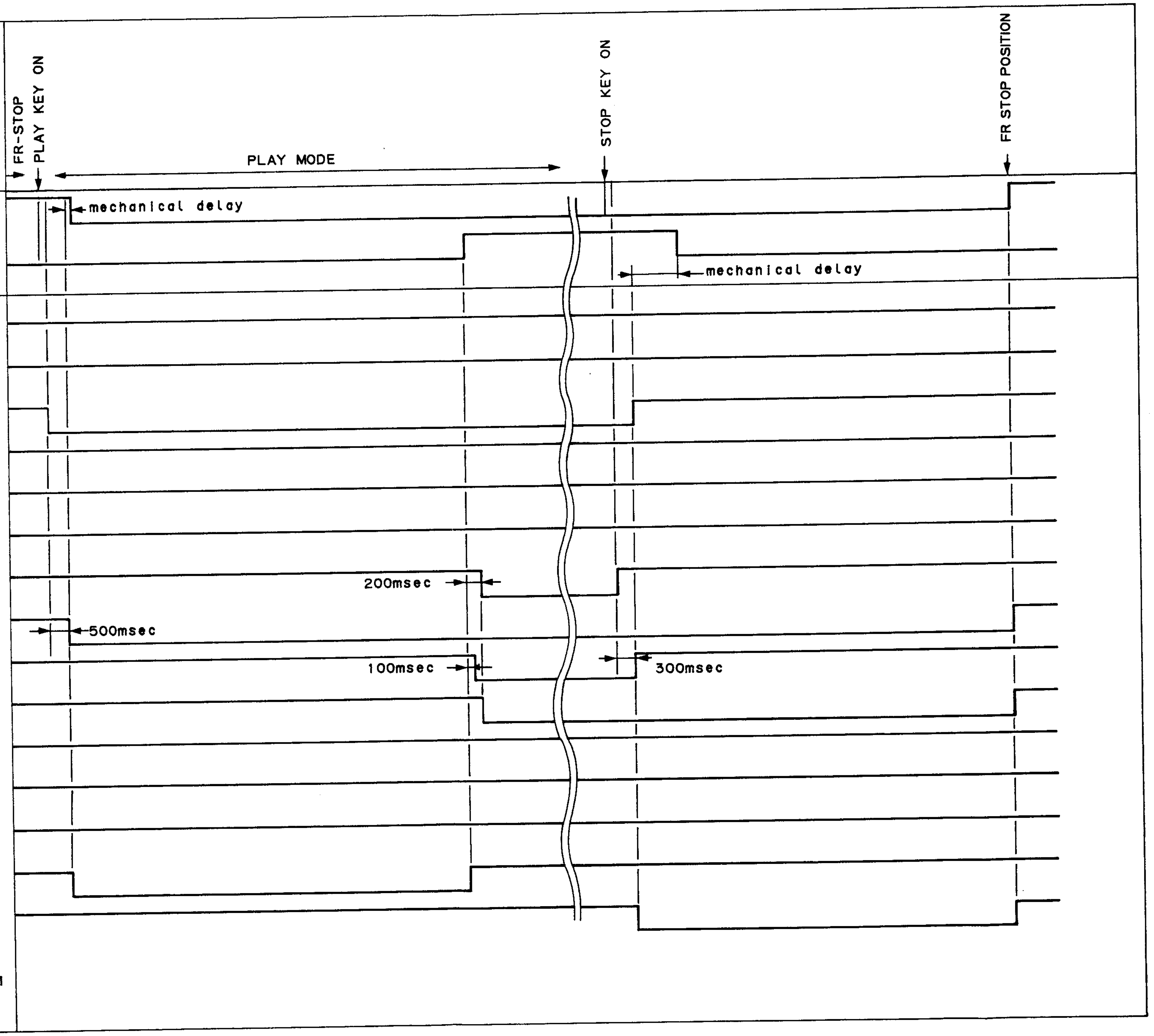
4. REW MODE (FR STOP→REW→FR STOP)

	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	L : REEL STOP	09 — DIGIT 2	
OUTPUT	H : DRUM STOP	01 — DIGIT 1	IC7-45
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : PINCH SOL.ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
	L : C.C. UP	07 — DIGIT 1	IC7-16
	L : C.C. DOWN	07 — DIGIT 2	IC7-15
	L : THREAD MOTOR ON	07 — DIGIT 3	IC7-13
	L : UNTHREAD MOTOR ON	07 — DIGIT 4	IC7-14
			ON SY-51 BOARD



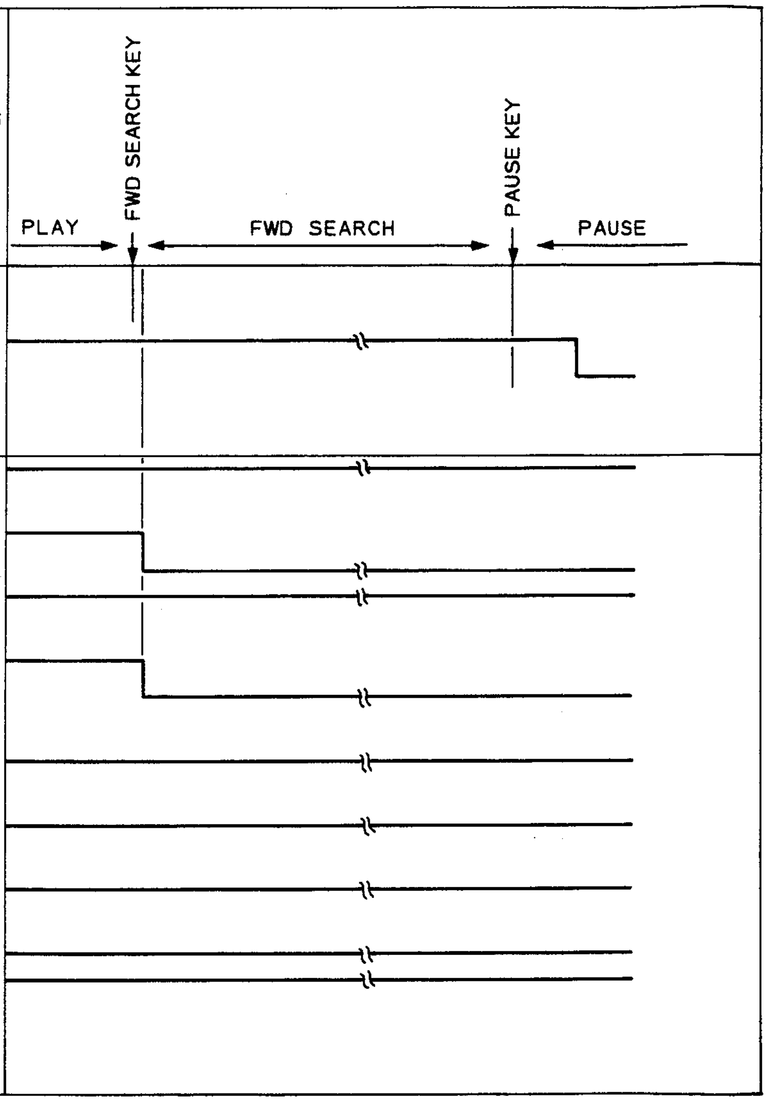
5. PLAY MODE (FR STOP→PLAY→FR STOP)

	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	L : THREAD END	OL — DIGIT 3	IC7-5
	L : UNTHREAD END	OL — DIGIT 4	IC7-6
OUTPUT	FWD / $\overline{\text{REV}}$	00 — DIGIT 1	IC7-41
	NORMAL / $\overline{\text{SEARCH}}$	00 — DIGIT 2	IC7-40
	H : DRUM STOP	01 — DIGIT 1	IC7-45
	L : SKEW SOL.ON	02 — DIGIT 2	IC7-48
	H : REEL STILL	03 — DIGIT 3	IC7-58
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : PINCHH SOL.ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
	L : C.C UP	07 — DIGIT 1	IC7-16
	L : C.C DOWN	07 — DIGIT 2	IC7-15
	L : THREAD MOTOR ON	07 — DIGIT 3	IC7-13
	L : UNTHREAD MOTOR ON	07 — DIGIT 4	IC7-14
			ON SY-51 BOARD


FR-STOP
PLAY KEY ON
PLAY MODE
STOP KEY ON
FR STOP POSITION
mechanical delay
mechanical delay
200msec
500msec
100msec
300msec

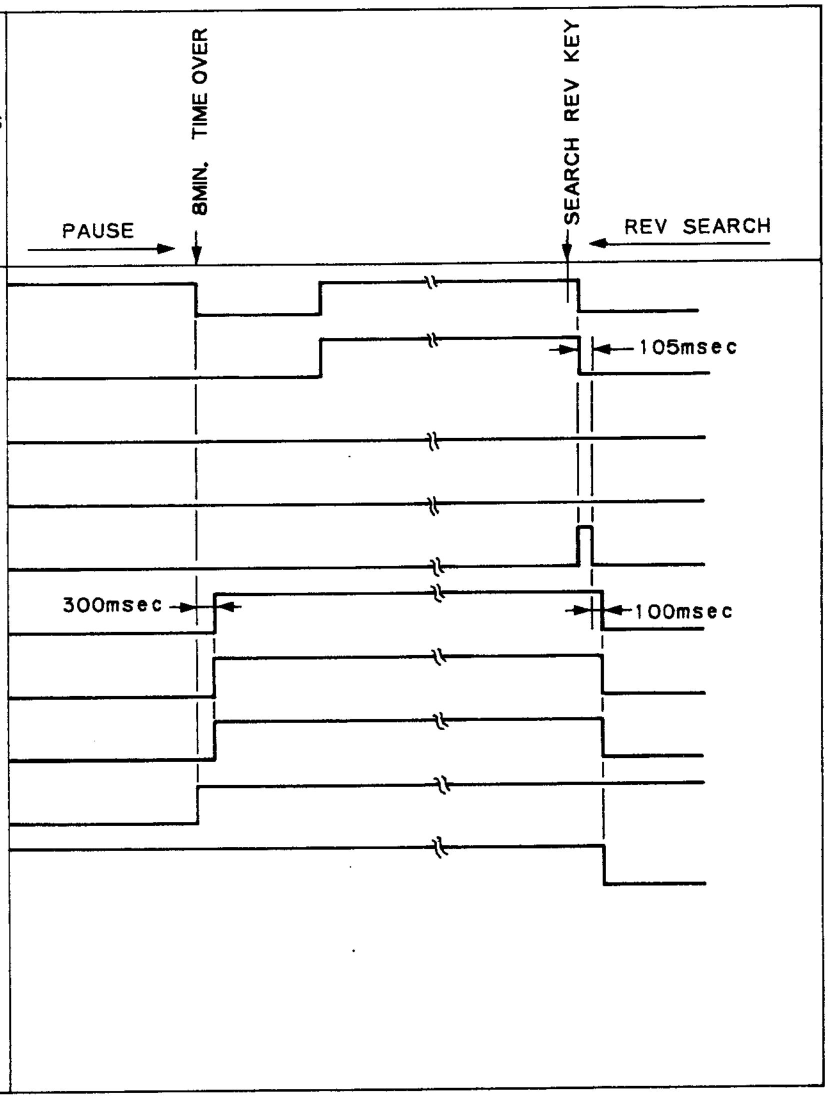
6. PLAY→FWD SEARCH→SEARCH PAUSE

	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	L : CAPSTAN STOP	OL — DIGIT 1	IC7-8
OUTPUT	FWD / $\overline{\text{REV}}$	00 — DIGIT 1	IC7-41
	NORMAL / $\overline{\text{SEARCH}}$	00 — DIGIT 2	IC7-40
	H : REEL STILL	03 — DIGIT 3	IC7-58
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : PINCH SOL.ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
			ON SY-51 BOARD



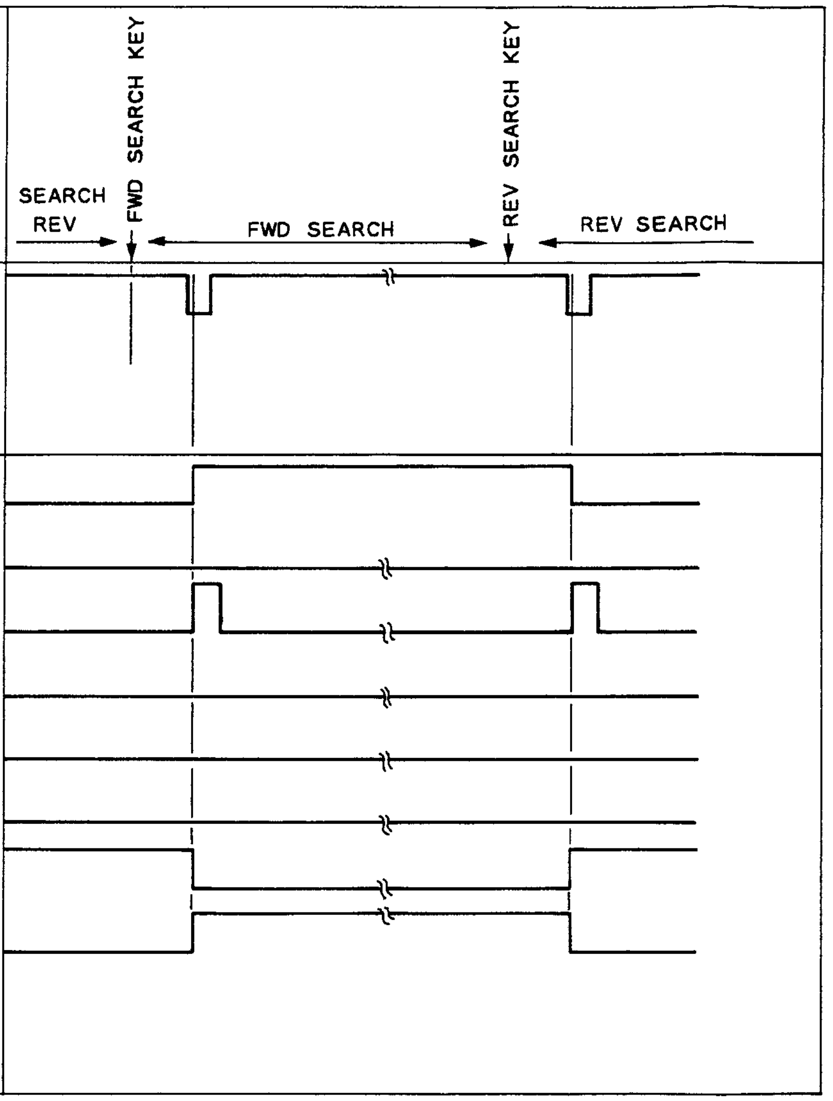
7. PLAY PAUSE→LONG PAUSE→REV SEARCH

	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
OUTPUT	FWD / $\overline{\text{REV}}$	00 — DIGIT 1	IC7-41
	NORMAL / $\overline{\text{SEARCH}}$	00 — DIGIT 2	IC7-40
	H : DRUM STOP	01 — DIGIT 1	IC7-45
	H : REEL STILL	03 — DIGIT 3	IC7-58
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : PINCH SOL.ON	04 — DIGIT 3	IC7-22
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L : S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
			ON SY-51 BOARD


8MIN. TIME OVER
SEARCH REV KEY
PAUSE
REV SEARCH
105msec
300msec
100msec

8. REV SEARCH→(FWD PAUSE)→FWD SEARCH→(FWD PAUSE)→REV SEARCH

	SIGNAL	LABEL NUMBER ON DIAGNOSTICS	MEASURING POINT
INPUT	L : CAPSTAN STOP	OL — DIGIT 1	IC7-8
OUTPUT	FWD / $\overline{\text{REV}}$	00 — DIGIT 1	IC7-41
	NORMAL / $\overline{\text{SEARCH}}$	00 — DIGIT 2	IC7-40
	H : REEL STILL	03 — DIGIT 3	IC7-58
	L : SEARCH SOL.ON	04 — DIGIT 2	IC7-23
	L : T-BRAKE SOL.ON	05 — DIGIT 1	IC7-37
	L : S-BRAKE SOL.ON	05 — DIGIT 2	IC7-36
	L : T-IDLER SOL.ON	05 — DIGIT 3	IC7-35
	L ; S-IDLER SOL.ON	05 — DIGIT 4	IC7-34
			ON SY-51 BOARD


FWD SEARCH KEY
REV SEARCH KEY
SEARCH REV
FWD SEARCH
REV SEARCH

2-12. SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the unit to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

(1) A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufactur's instructions to use these instruments.
(2) A battery-operated AC milliammeter. The Date Precision 245 digital multimeter is suitable for this job.
(3) Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V; therefore, analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable.
(Refer to Fig. A)

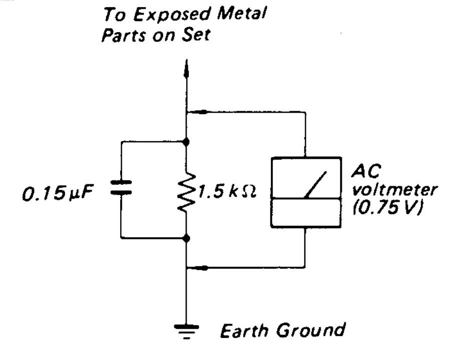


Fig. A. Using an AC voltmeter to check AC leakage.

2-13. FIXTURE

Part No.	Description
J-6001-820-A	Drum Eccentricity Gauge (3)
J-6001-830-A	Drum Eccentricity Gauge (2)
J-6001-840-A	Drum Eccentricity Gauge (1)
J-6001-930-A	Drum Eccentricity Gauge (4)
J-6009-830-A	Flatness Plate
J-6026-240-A	Adjustment Driver (for electrical alignment)
J-6130-010-A	Reel Table Height Check Base Jig
J-6130-020-A	Reel Table Height Check Jig
J-6153-020-A	Dihedral Adjustment Screwdriver
Y-2031-001-0	Cleaning Fluid
2-034-697-00	Cleaning Piece
3-702-215-01	Torque Measurement Tape (100mm dia.)
3-702-216-01	Back Tension Adjustment Jig
7-661-018-01	Sony Oil
7-732-050-20	Tension Scale (50g full scale)
7-732-050-30	Tension Scale (100g full scale)
7-732-050-40	Tension Scale (200g full scale)
7-732-050-50	Tension Scale (500g full scale)
8-960-015-04	Alignment Tape, RR5-3SA
9-911-053-00	Thickness Gauge
Standard Products.	Head Demagnetizer, HE-4

SECTION 3
PERIODIC CHECK AND MAINTENANCE

It is recommended that the following maintenance and the periodic check be performed for the best operation of the function and performance of the machine and to prolong the live of the machine and the tape.

3-1. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after repairs regardless of the operating hours of the machine.

(1) Cleaning of the video heads
- Press a cleaning piece moistured with cleaning fluid and turn the drum slowly with the hand, cleaning the heads. (Never turn the motor with electric power to clean.)
- Never move the cleaning piece in a vertical direction of the head tip in the cleaning. This might damage the head tips.

(2) Cleaning of the tape running system
- Wipe the tape bearing surfaces (of the tape guide, drum, capstan, and pinch roller) with a cleaning piece saturated with cleaning fluid.

(3) Cleaning of the drive system
- Wipe the drive system (such as belt, idler, and reel table surface) with a cleaning piece saturated with cleaning fluid.

3-2. PERIODIC CHECK

Perform the maintenance checks described separately in accordance with the operational hours of the machine.

3-3. OTHERS

(1) Sony oil
- Be sure to use Sony oil as the lubrication oil. (If oil other than Sony oil is used, various troubles due to a different viscosity might occur.)

Sony oil : Part No. 7-661-018-01
- Used Sony oil, in which dust or other foreign material have not been mixed, for lubricating the bearing. (If foreign material is in the oil, wear or burning of the bearing might occur.)

(2) Grease

Be sure to use the following grease.

Sony grease : Part No. 7-662-001-62 (SGL-501)

(3) Overhaulling of the equipment

When overhaulling the equipment is attempted, replace parts at the intervals indicated in the chart on page 3-2. For parts not in the list, such as motors and heads, refer the following items.
- Reel motor : about 2,000 hours
- Capstan motor : about 3,000 hours
- Threading motor : about 30,000 times
- Cassette-up compartment motor : about 30,000 times
- Audio/CTL head : about 3,000 hours
- CTL head : about 3,000 hours

■ : apply oil ○ : cleaning ◆ : replace ◇ : check ◎ : apply grease

	Operating Hours (H)											
Item	Part No. of Replacement Parts	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape path cleaning	———	○	○	○	○	○	○	○	○	○	○	Perform whenever repair work is attempted *NOTE 1
Video heads cleaning and replace	A-6709-560-A	○	◆	○	◆	○	◆	○	◆	○	◆	Life of the video heads are affected extensively by operating ambient conditions *NOTE 2
Replacement of pinch roller	A-6750-205-A	○	◆	○	◆	○	◆	○	◆	○	◆	Life of the pinch roller are affected extensively by operating systems *NOTE 3
Replacement of FF/REW idler belt	3-668-785-00	○	○	○	◆	○	○	○	◆	○	○	———
Replacement of reel table	A-6739-016-A	○	■	○	◆	○	■	○	◆	○	■	*NOTE 4
Replacement of R brake shoe	X-3668-737-0	—	—	—	◆	—	—	—	◆	—	—	*NOTE 5
Replacement of brake band	X-3668-707-0	—	—	—	◆	—	—	—	◆	—	—	*NOTE 6
Replacement of belt on gear box	3-672-737-01	○	○	○	○	○	○	○	◆	○	○	———
Replacement of belt on cassette-up compartment	3-653-387-00	○	○	○	○	○	○	○	◆	○	○	———
Cleaning the shaft of the threading roller on the threading ring	———	—	○	—	○	—	○	—	○	—	○	Clean with a cloth saturated with a cleaning fluid *NOTE 7
Apply a grease on the ring rollers	———	—	◎	—	◎	—	◎	—	◎	—	◎	Apply grease on the surface of the ring roller
Check the FWD back tension	———	—	◇	—	◇	—	◇	—	◇	—	◇	*NOTE 8
Check the FWD torque	———	—	◇	—	◇	—	◇	—	◇	—	◇	*NOTE 9
Check the REV torque	———	—	◇	—	◇	—	◇	—	◇	—	◇	*NOTE 10
Check the brake torque	———	—	—	—	◇	—	◇	—	◇	—	◇	*NOTE 11

*NOTE 1 :Refer to Section 3-1.

*NOTE 2 :Refer to Section 3-1.

*NOTE 3 :After this replacement, perform the adjustments as follows: Section 4-7 "Pinch Roller Replacement".

*NOTE 4 :After this replacement, perform the adjustments as follows: Section 4-7 "Take-up Reel Table Replacement" and "Supply Reel Table Replacement".

*NOTE 5 :After this replacement, perform the adjustments as follows: Section 4-7 "R Brake Shoe Replacement".

*NOTE 6 :After this replacement, perform the adjustments as follows: Section 4-7 "Brake Band Replacement".

*NOTE 7 :Refer to Section 4-6.

*NOTE 8 :Refer to Section 6-6.

*NOTE 9 :Refer to Section 6-3.

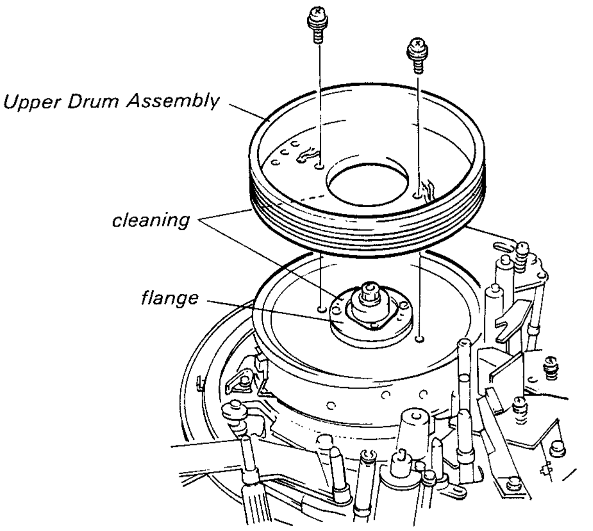
*NOTE 10 :Refer to Section 6-4.

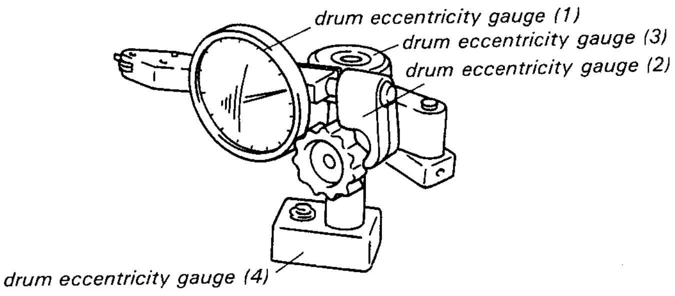
*NOTE 11 :Refer to Section 6-1.

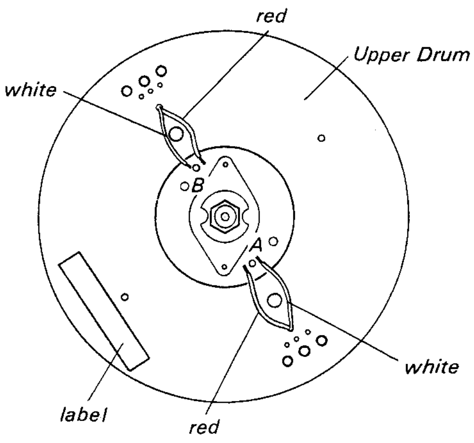
SECTION 4
REPLACEMENT OF MAJOR PARTS

4-1. REPLACEMENT OF THE UPPER DRUM ASSEMBLY

- The Rotary Video Heads cannot be replaced individually; the entire Upper Drum Assembly must be replaced when any one of these heads fails.


Upper Drum Assembly
cleaning
flange


drum eccentricity gauge (1)
drum eccentricity gauge (3)
drum eccentricity gauge (2)
drum eccentricity gauge (4)


red
Upper Drum
white
B
A
white
label
red

Tool: Drum eccentricity gauge (1)
Drum eccentricity gauge (2)
Drum eccentricity gauge (3)
Drum eccentricity gauge (4)

Replacement procedure:

(1) Unsolder the four leads of the video head from the printed circuit board. Remove the two fixing screws, and then remove the Upper Drum Assembly from the Head Drum Assembly.

(2) Clean the matching surfaces of the flange and new Upper Drum Assembly with a cloth moistened with cleaning fluid. (If there is a spacer between the drum and the flange, it should be remain in place, or be re-installed in the same place with the new Upper Drum Assembly.)

(3) Place the Upper Drum Assembly so that the position of the label comes to right side viewing from "B" as shown in the figure. Thread the two fixing screws snugly but do not tighten.

Adjustment procedure:

(1) Remove the S Guard Block. (Because the S Guard's bottom connector is inserted into the connector on the chassis, the power should been disconnected.)

(2) Assemble the drum eccentricity gauges (1), (2), (3) and (4) as shown in the figure. Mount the assembled gauges on the unit so that the tip probe is positioned at a point about 5mm from the top edge of the Upper Drum.

(3) Turn the Upper Drum slowly clockwise and confirm that the pointer deflection of the gauge is within 5 microns during one complete turn of the Upper Drum. If this specification is satisfied, proceed with Step (5). If it is not, perform Step (4).

(4) Tap the inside of the Upper Drum with a nylon hammer or a screwdriver handle so that the gauge deflection remains within 5 micron.

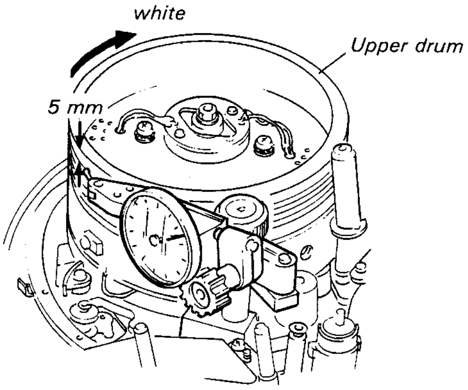
(5) After the adjustment, tighten the two fixing screws that secure the Upper Drum, alternately and gradually using a tightening torque: 14 to 16 kg.cm.

(6) After the screws are tightened, check again that the eccentricity of the Upper Drum is within 5 microns.

(7) Solder the four leads from the video heads to the printed circuit board.

(8) Install the S Guard Block.

(9) Perform the adjustments in Section 4-7.



4-2. REPLACEMENT OF THE DRUM ASSEMBLY

Replacement procedure:

(1) Remove the Shield Plate.

(2) Disconnect the three connectors of the drum assembly on the back of the chassis.

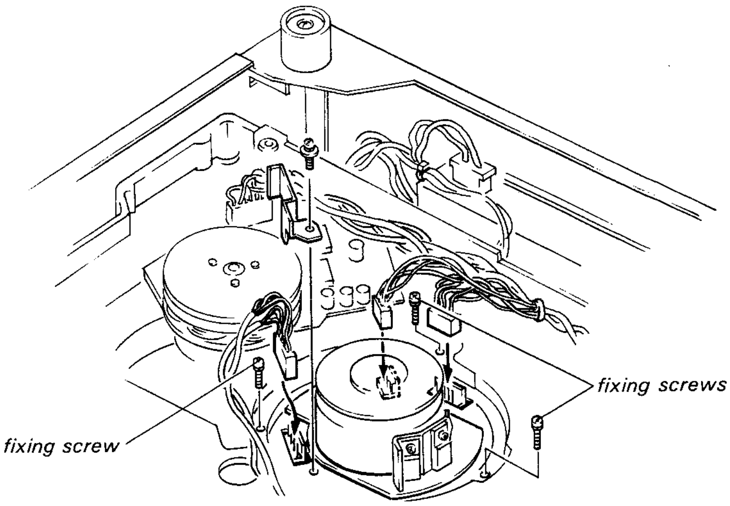
(3) Remove the three fixing screws from the drum.

(4) Install the drum on the base while turning the drum assembly in the clockwise direction, as viewed from top of the unit.

(5) Reconnect the three connectors.

(6) Tighten the fixing screw of the Shield Plate.

(7) After replacement, perform the adjustments in Section 4-7.



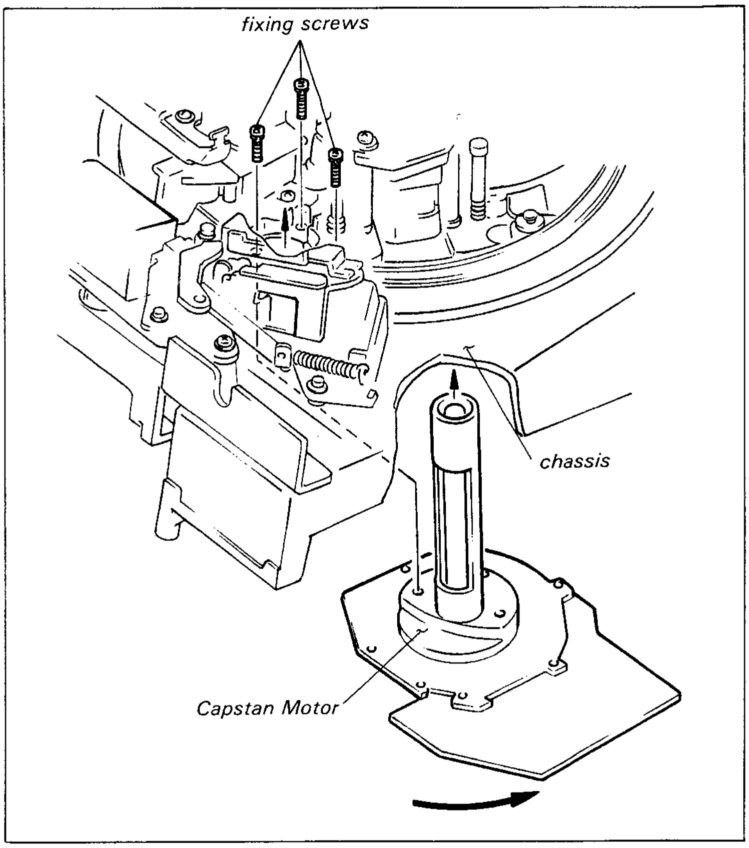
4-3. REPLACEMENT OF THE CAPSTAN MOTOR

Replacement procedure:

(1) Remove the Capstan Motor.

(2) Install the new Capstan Motor and thread the three fixing screws snugly but do not tighten.

(3) Tighten the fixing screws while turning the Capstan Motor in the counterclockwise (the direction of the arrow).

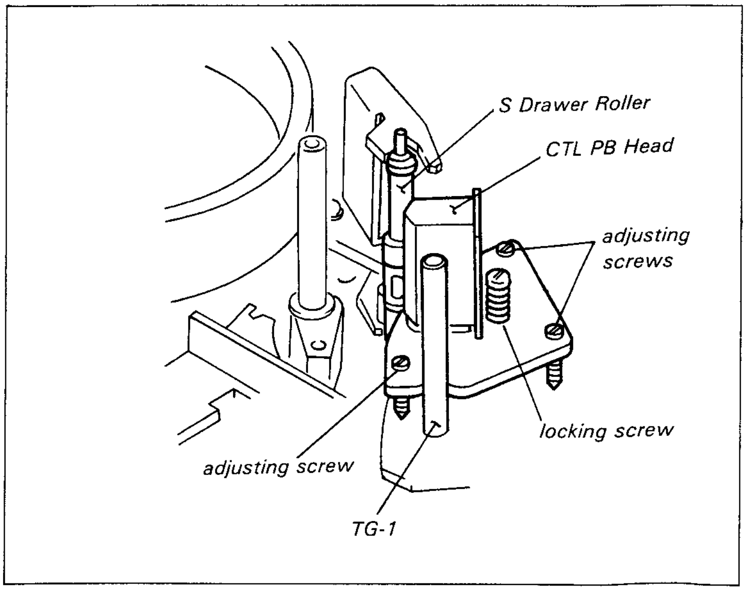

fixing screws
chassis
Capstan Motor

4-4. REPLACEMENT OF THE CTL PB HEAD

Replacement procedure:

(1) Remove the locking screw and remove the CTL PB Head from the chassis. (At this time, never tighten or loosen the three adjusting screws.)

(2) Loosen the two fixing screws under the bracket and replace the CTL PB Head.


S Drawer Roller
CTL PB Head
adjusting screws
locking screw
adjusting screw
TG-1

4-5. REPLACEMENT OF THE S DRAWER ROLLER

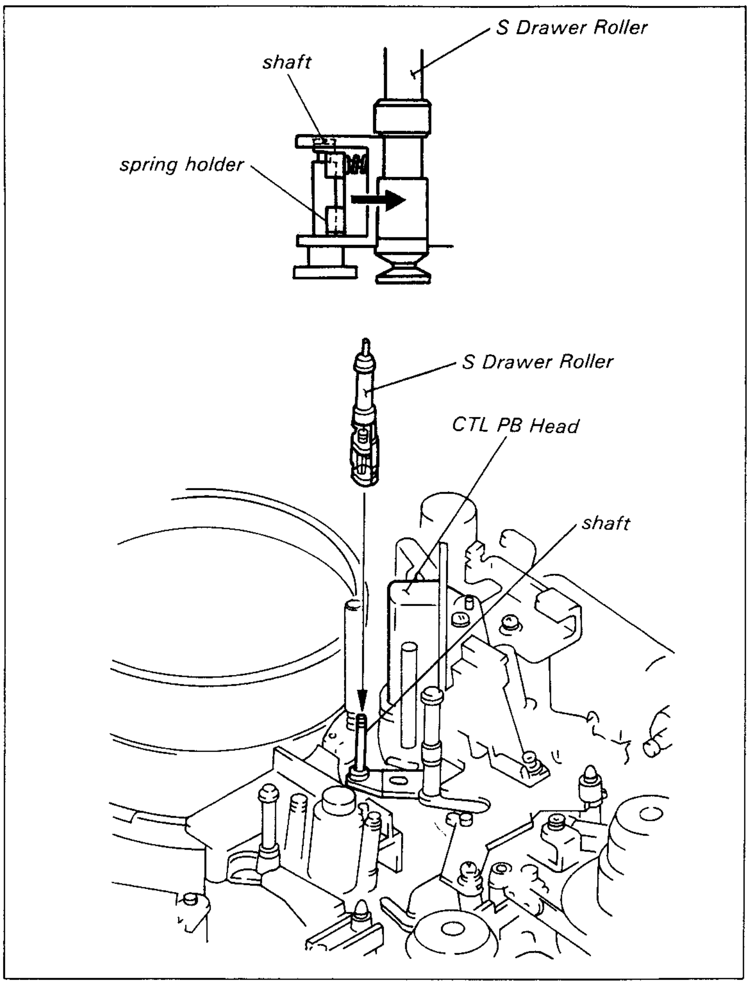
Replacement procedure:

(1) Put the unit into the EJECT completion mode, without a cassette tape.

(2) Turn the pulley of the Gear Box by hand until the S Drawer Roller is in front of the CTL PB Head.

(3) Remove the S Drawer Roller from the shaft while pushing the spring holder in the direction of the arrow.

(4) While pushing the spring holder in the direction of the arrow, install the new S Drawer Roller onto the shaft until the S Drawer Roller locks to the shaft.


S Drawer Roller
shaft
spring holder
S Drawer Roller
CTL PB Head
shaft

4-6. REPLACEMENT/ADJUSTMENT OF THE TAPE GUIDES ON THE THREADING RING

- There are three tape guides on the Threading Ring. This section describes the replacement of the three tape guides and the width adjustment of the two guides.

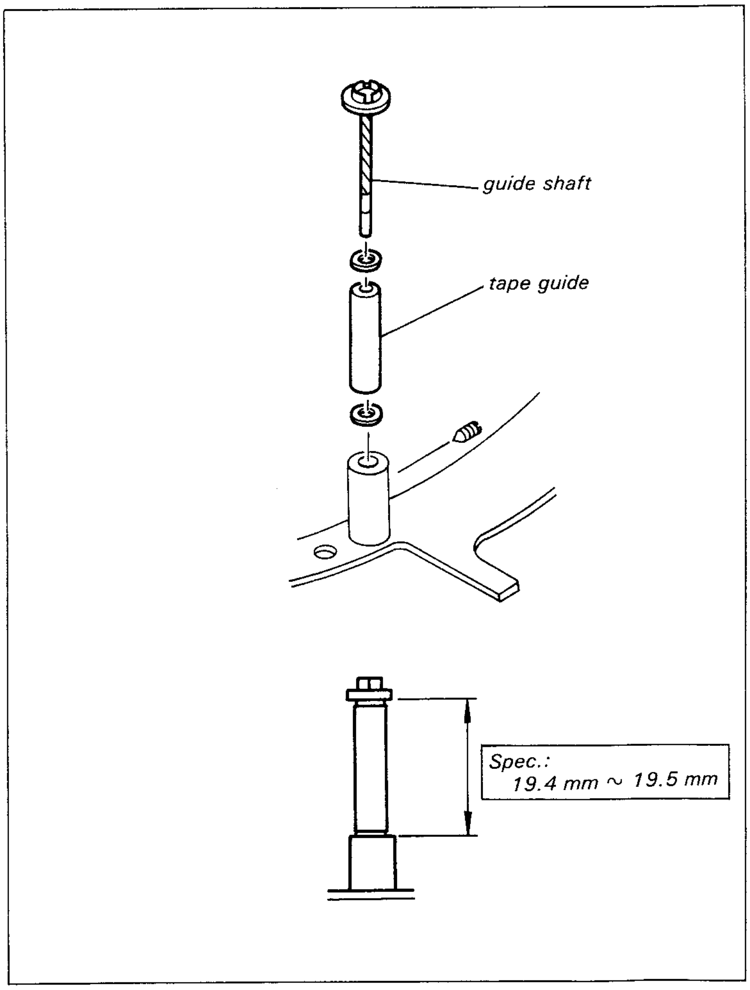
Tool: Slide vernier calliper or equivalent
Cleaning fluid

Replacement procedure:

(1) Remove the tape guide.
(2) Clean the surface of the shaft with a cloth moistened with the cleaning fluid.
(3) Assemble the parts.
(4) Adjust the guide width of the sub-ring upper tape guide and lower tape guide.

Adjustment procedure:

(1) Adjust the tape guide width to meet the required specification.



4-7. ITEMS TO BE ADJUSTED AFTER MAIN PARTS REPLACEMENT

(Nambers in parenthesis refer to Section Nos.)

Replacement of Threading Ring

Threading Ring Rotation Adjustment (5-3-1) → Gear Box Position Adjustment (5-3-2) → FR Detector Block Mounting Position Adjustment (5-3-4) → Pinch Roller Position Adjustment (5-3-3) → Pinch Lever Pre-set Adjustment (5-4-1) → Pinch Roller Pre-set Adjustment (5-4-2) → FF/REW Modes Tape Path Adjustment (7-1) → T Correction Guide Slantness Adjustment (7-2) → Tape Path Adjustment Around Pinch Roller (7-6) → FWD Mode Tape Path Adjustment (1) (7-3) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → Video Tracking Adjustment (7-7-1) → CTL PB Head Height/Azimuth/Zenith Adjustments (7-7-2) → Video Tracking Adjustment (check) (7-7-1)

Replacement of Pinch Roller

Pinch Roller Position Adjustment (5-3-3) → Pinch Roller Pre-set Adjustment (5-4-2) → → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → → Tape Path Adjustment Around Pinch Roller (7-6) → Video Tracking Adjustment (check)(7-7-1)

Replacement of Take-up Reel Table

Reel Table Height and Vertical Play Adjustment (5-1-2) → T Brake Torque Adjustment (6-1-2) → REW Brake Torque Adjustment (6-1-3) → FF/REW Torque Adjustment (6-2) FWD Torque Adjustment (6-3) → FF/REW Modes Tape Path Adjustment (7-1)

Replacement of Supply Reel Table

Reel Table Height and Vertical Play Adjustment (5-1-2) → S Brake Torque Adjustment (6-1-1) → FF/REW Torque Adjustment (6-2) → REV Torque Adjustment (6-4) → FF Back Tension Adjustment (6-5) → FWD Back Tension Adjustment (6-6) → Video Tracking Adjustment (check) (7-7-1)

Replacement of Brake Band

FF Back Tension Adjustment (6-5) → FWD Back Tension Adjustment (6-6)

Replacement of Capstan Motor

Pinch Lever Right Angle Adjustment (5-10) → Pinch Roller Position Adjustment (5-3-3) → Capstan Search Speed Adjustment (9-3) → Capstan FWD/REV Detector Adjustment (9-5) → Capstan Free Speed Adjustment (9-2) → Capstan Stop Servo Adjustment (9-4, 9-6) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → Tape Path Adjustment Around Pinch Roller (7-6) → Video Tracking Adjustment (check) (7-7-1)

Replacement of Threading Motor

Gear Box Position Adjustment (5-3-2)

Replacement of Reel Motor

FWD Torque Adjustment (6-3) → REV Torque Adjustment (6-4)

Replacement of CTL PB Head

CTL PB Head Height/AZimuth/Zenith Adjustments (7-7-2) ⟶ Video Tracking Adjustment (check) (7-7-1)

Replacement of Audio/CTL Head

Audio Head Height Adjustment (7-7-3) ⟶ Audio Head Azimuth Adjustment (7-7-5) ⟶ Video Tracking Adjustment (7-7-1) ⟶ Audio Head Height Adjustment (7-7-3) ⟶ Audio Head Azimuth Adjustment (7-7-5) ⟶ Audio Head Phase Adjustment (7-7-6) ⟶ Audio/CTL Head Position Adjustment (7-7-7) ⟶ Audio System Alignment (all of Section 10)

Replacement of Drum Assembly

Tracking Adjustment (7-7) ⟶ FF/REW Modes Tape Path Adjustment (7-1) ⟶ FWD Mode Tape Path Adjustment (2) (7-4) ⟶ REV Mode Tape Path Adjustment (7-5) ⟶ Video Head Dihedral Adjustment (7-8) ⟶ Drum AFC Level Adjustment (9-9) ⟶ Drum AFC Transient Adjustment (9-10) ⟶ Switching Position Adjustment (9-12)

Replacement of Upper Drum Assembly

Replacement of Upper Drum (4-1) ⟶ Tracking Adjustment (7-7) ⟶ FF/REW Modes Tape Path Adjustment (7-1) ⟶ FWD Mode Tape Path Adjustment (2) (7-4) ⟶ REV Mode Tape Path Adjustment (7-5) ⟶ Video Head Dihedral Adjustment (7-8) ⟶ PB RF Amplifier Adjustment (11-1; 11-1-1 to 11-1-2)

SECTION 5

LINK AND DRIVE SYSTEM ALIGNMENT

5-1. REEL TABLE SYSTEM ADJUSTMENT

5-1-1. Cassette Holder Position Adjustment

Tool: Reel table height check base jig
Thickness gauge

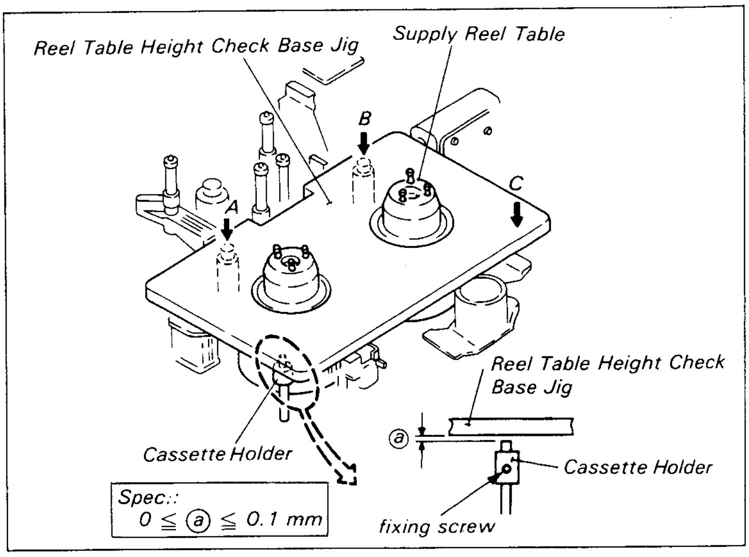
Mode: EJECT completion

Check procedure:

(1) While lightly pushing the Reel Table Height Check Base Jig marked (A), (B) and (C) toward the chassis, check that the clearance between the base jig and the cassette holder meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Cassette Holder so that it meets the required specification.


Reel Table Height Check Base Jig
Supply Reel Table
B
A
C
Cassette Holder
Reel Table Height Check Base Jig
ⓐ
Cassette Holder
fixing screw

Spec.:
$0 \leqq ⓐ \leqq 0.1$ mm

5-1-2. Reel Table Height and Vertical Play Adjustment

- Because the Reel Table Height from the chassis functions as the reference height in the entire tape thread and run system, it is required that the Reel Table Height Adjustment be attempted carefully, and deliberately.

Tool: Reel table height check base jig
Reel table height check jig
Slide vernier callipers or equivalent

Mode: EJECT completion

Check procedure:

(1) The probes of the Reel Table Height Check Jig marked "SO" and "TO" can slide over the reel table, leaving a space between the jig and the reel table, while the probes marked "SX" and "TX" are blocked, and cannot slide over reel table.

- Use the "SO" and "SX" probes for the Supply Reel Table.
- Use the "TO" and "TX" probes for the Take-up Reel Table.

(2) After tighten the upper portion of the reel table with the fixing screw, push up and down on the reel table for inspection. Check that the vertical play meets the required specification.

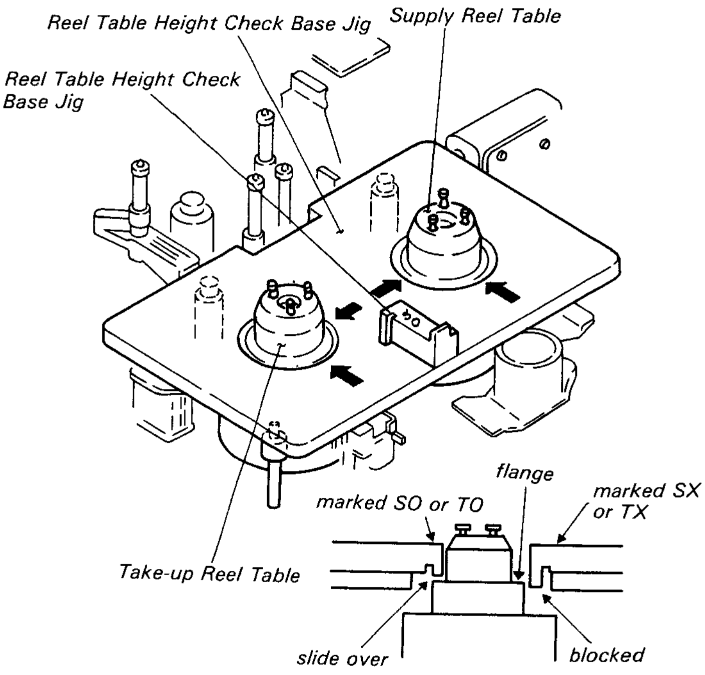
Adjustment procedure:

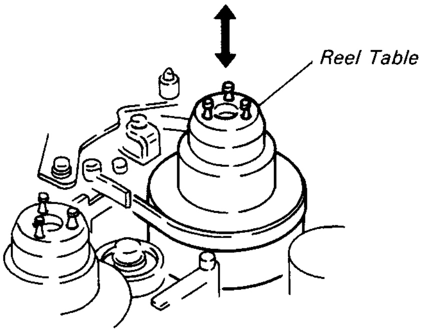
(1) Adjust the height with the washer under the reel table.

(2) Adjust the vertical play with the washer on top of the reel table.

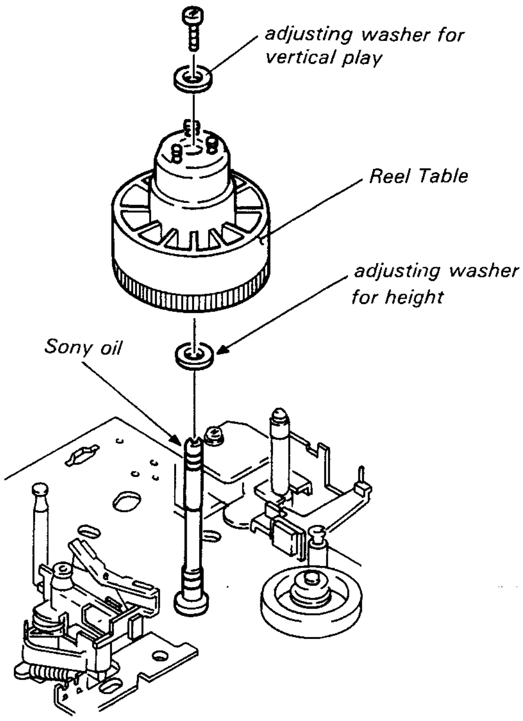
NOTE : Whenever the reel table is removed and its height is adjusted with a washer, apply a drop of Sony oil on the reel shaft as shown in the figure. The amount of oil should be one drop (the amount that is scooped by the tip of 2mm diameter twig such as pencil lead).

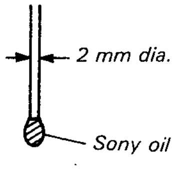
- Adjustment poly-slider washer:
  3-701-444-01 6mm dia. 0.13mm thick
  3-701-444-11 6mm dia. 0.25mm thick
  3-701-444-21 6mm dia. 0.5mm thick


Reel Table Height Check Base Jig
Supply Reel Table
Reel Table Height Check Base Jig
flange
marked SO or TO
marked SX or TX
Take-up Reel Table
slide over
blocked



Spec.:
Vertical play
0.17 mm ~ 0.38 mm


adjusting washer for vertical play
Reel Table
adjusting washer for height
Sony oil


2 mm dia.
Sony oil

5-2. T DRAWER ARM ADJUSTMENT

5-2-1. T Drawer Arm EJECT Position Adjustment

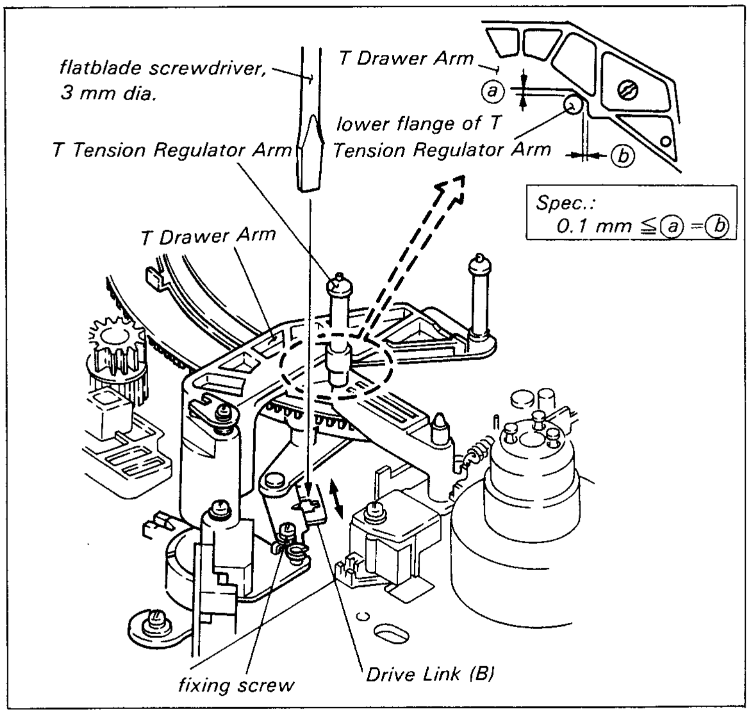
Mode: Put the unit into the FR-STOP mode without a cassette tape. Press the EJECT button and place the unit into the EJECT completion mode.

Check procedure:

(1) Check that the relationship between the lower flange of the T Tension Regulator Arm and the T Drawer Arm meets the required specification.

Adjustment procedure:

(1) Adjust the position of Drive Link (B) Ass'y with a flatblade screwdriver (3mm dia.) so that it meets the required specification.


flatblade screwdriver, 3 mm dia.
T Drawer Arm
ⓐ
lower flange of T Tension Regulator Arm
ⓑ
T Tension Regulator Arm
T Drawer Arm
fixing screw
Drive Link (B)

Spec.:
0.1 mm ≦ ⓐ = ⓑ

5-2-2. Unthread-end Switch Position Adjustment

Tool: Black vinyl tape
(1 cm x 1.5 cm)

Preparation:

(1) Put the unit into the FR-STOP mode; turn the power OFF in the FR-STOP mode.

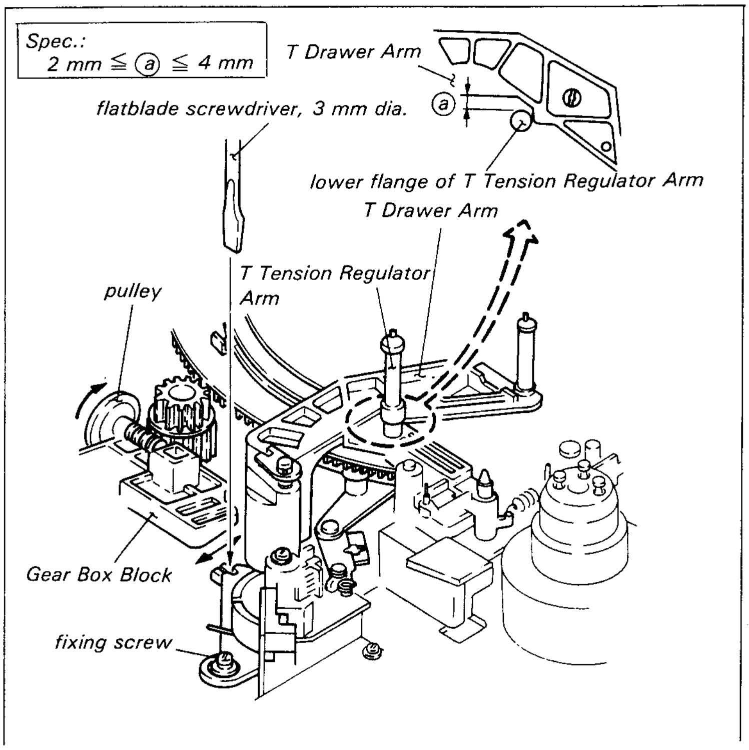
(2) Remove the FR Detector Block, and cover the D2 photointerrupter (FR-UNTHREAD END Detector) with the black vinyl tape (placing the FR Detector in the FR-STOP mode constantly).

Check procedure:

(1) Turn the power ON and rotate the pulley of Gear Box Block in the clockwise direction by hand.

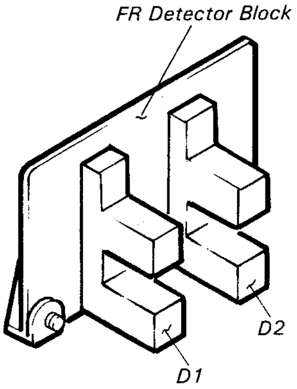
(2) When the relationship of the T Drawer Arm and the T Tension Regulator Arm is as shown in the figure, check that a energized noise of the Take-up Brake Solenoid is heard at that moment.

Spec.:
2 mm ≦ ⓐ ≦ 4 mm


T Drawer Arm
flatblade screwdriver, 3 mm dia.
ⓐ
lower flange of T Tension Regulator Arm
T Drawer Arm
T Tension Regulator Arm
pulley
Gear Box Block
fixing screw

Adjustment procedure:

1. (1) Adjust the position of the Photointerrupter Holder with a flatblade screwdriver (3mm dia.) so that it meets the required specification.
2. (2) Turn the power OFF, and mount the FR Detector Block after peeling off the black vinyl tape.
3. (3) Adjust the FR Detector Block's mounting position. (Refer to Section 5-3-4.)
4. (4) Hook the spring from the Pinch Lever Block on the FR Detector Block.



5-3. THREADING SYSTEM ADJUSTMENT

5-3-1. Threading Ring Rotation Adjustment

- This adjustment is required only when the Threading Ring is replaced or removed.
- If the Threading Ring is adjusted to have a narrower clearance, the ring rotation becomes heavy, or if adjusted to have a wider clearance, tape run during threading, FWD, and REV modes will be unstable.

Mode: Check mode: EJECT completion/
threading/unthreading
Adjustment mode: EJECT completion

Check procedure:

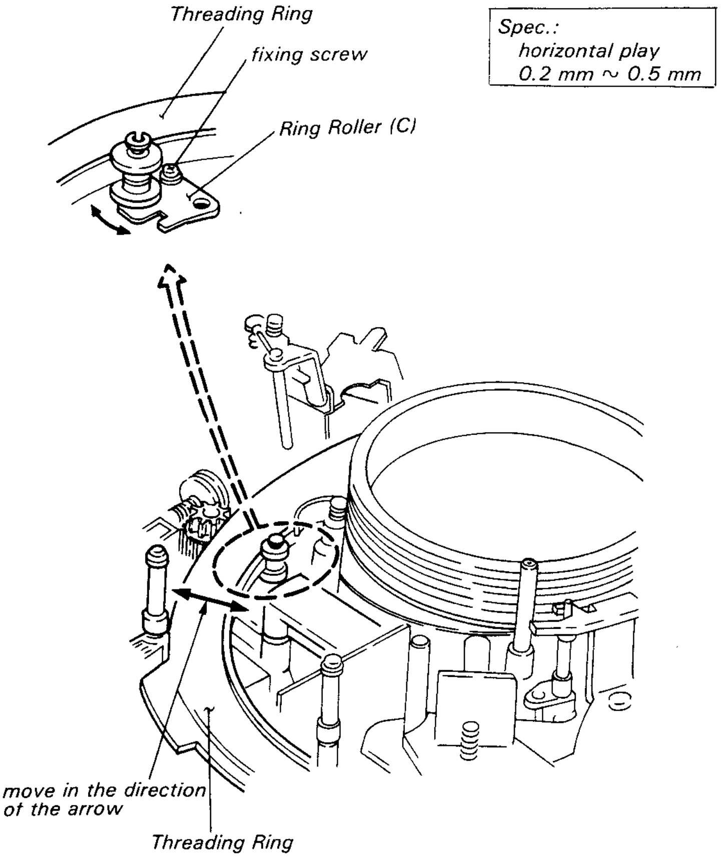
1. (1) Check that the horizontal play meets the required specification when the Threading Ring is pushed in the direction of the arrow while in the EJECT completion mode.
2. (2) Check that the rotation of the Threading Ring into the threading and unthreading modes is smooth.

Adjustment procedure:

1. (1) Put the unit into the EJECT completion mode.
2. (2) Adjust the position of the Ring Roller (C) so that it meets the required specification.

adjusting procedure:

- Insert a 0.3 mm thick piece of paper between the Threading Ring and the Ring Roller (C).
- The paper of this service manual is 0.1 mm thick so that the three pages becomes 0.3 mm thick.



5-3-2. Gear Box Position Adjustment

- It is required that the Section 5-3-1, Threading Ring Rotation Adjustment is correct before initiating this adjustment.

Mode: Put the unit into the EJECT completion mode; turn the pulley (as shown in the figure) 1/2 to 1 turn in the direction of arrow C.

Check procedure:

(1) Put the unit into the EJECT completion mode; turn the pulley (as shown in the figure) 1/2 to 1 turn in the direction of arrow C.

(2) In order to make them easier to see during the adjustment, mark the two lines on the top surface of the gear with a black felt tip pen.

(3) Turn the pulley so that one of the lines is roughly parallel to the outer circumference of the Threading Ring.

(4) Check that the relationship between the outer circumference of the Threading Ring and the Gear meet the required specification.

Adjustment procedure:

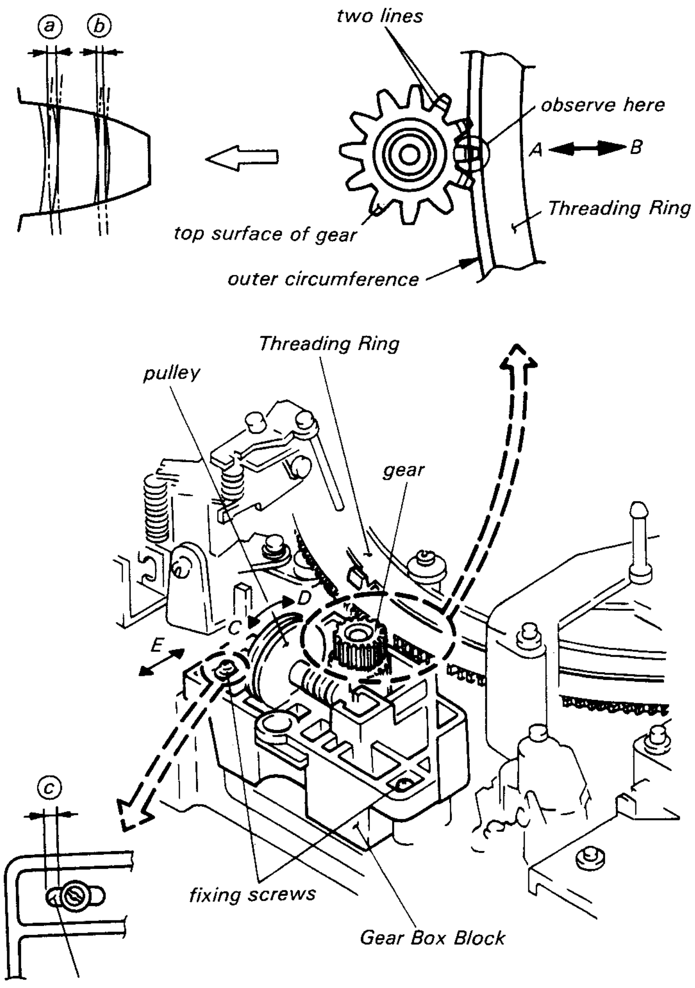
(1) Put the unit into the EJECT completion mode; turn the pulley (as shown in the figure) 1/2 to 1 turn in the direction of arrow C.

(2) Turn the pulley in the direction of arrow C or D so that one of the lines is roughly parallel to the outer circumference of the Threading Ring.

(3) Adjust the position of the Gear Box in the direction of arrow E to meet the required specification.

(4) Check the Section 5-3-1. Threading Ring Rotation Adjustment to meet the required specification.

Spec.:
(1) When the Threading Ring is moved in the direction of arrow A, its outer circumference is within the range ⓐ (inside the two lines on the gear).
(2) When the Threading Ring is moved in the direction of arrow B, its outer circumference is within the range ⓑ (outside the two lines on the gear).



Spec.:
0.1 mm ≦ ⓒ ≦ 1.5 mm

(5) When pushing the Threading Ring in the direction of arrow A, the relationship between the outer circumference of the Threading Ring and the Gear should meet the required specification (1).

(6) When pushing the Threading Ring in the direction of arrow B, the relationship between the outer circumference of the Threading Ring and the Gear should meet the required specification (2).

(7) Check that C meets the required specification with the longitudinal hole as shown in the figure of the Gear Box Block.

5-3-3. Pinch Roller Position Adjustment

- If the Pinch Roller Position Adjustment is incorrect, the tape will get sear in the instance of pinch roller's pressing against the capstan.

Mode: Install the cassette tape and put the unit into the PLAY mode

Check procedure:

(1) Put the unit into the PLAY mode.

(2) Check that the center of the Pinch Roller Shaft is in line with the Capstan Shaft and the hole in the Pinch Lever as shown in the figure.

Adjustment procedure:

- When the center of the Pinch Roller Shaft is positioned as shown in figure (a);

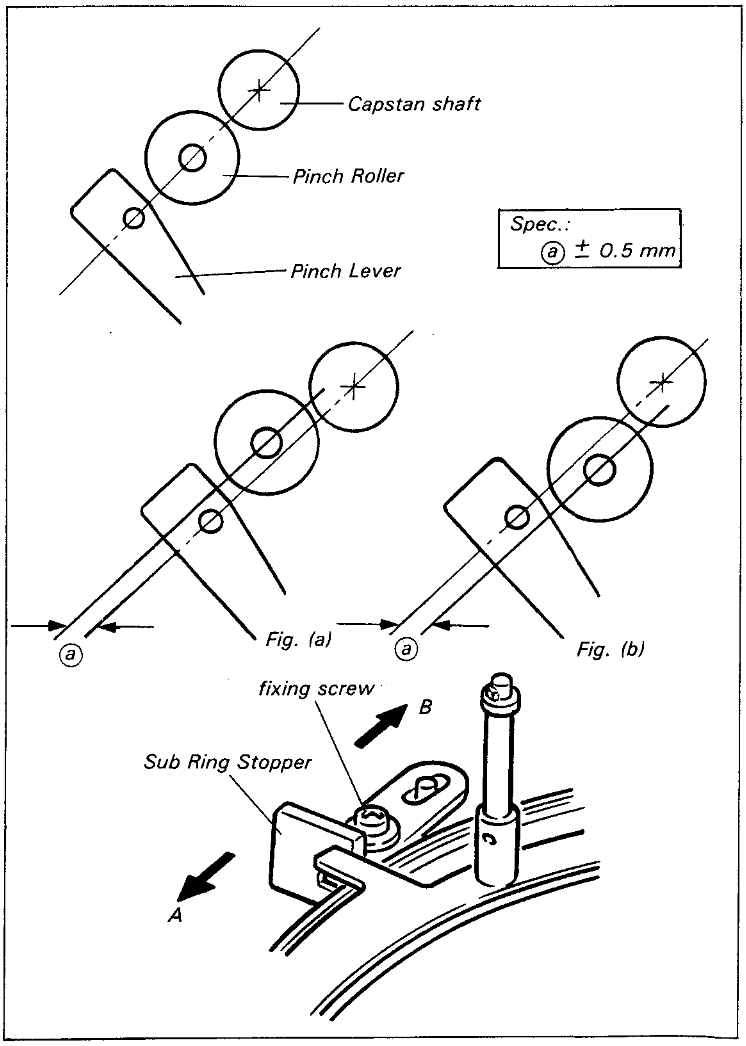
(1) Loosen the fixing screw of the Sub Ring Stopper. Move the Sub Ring Stopper in the direction of arrow (A) to meet the required specification, and tighten the fixing screw.

(2) Check as described in the check procedures.

- When the center of the Pinch Roller Shaft is positioned as shown in figure (b).

(3) Loosen the fixing screw of the Sub Ring Stopper. Move the Sub Ring Stopper in the direction of arrow (B) to meet the required specification, and tighten the fixing screw.

(4) Check as decribed in the check procedures.



5-3-4. FR Detector Block Mounting Position Adjustment

- It is required that the Section 5-3-1, Threading Ring Rotation Adjustment is correct before initiating this adjustment.

Mode: Adjustment mode: THREADING completion

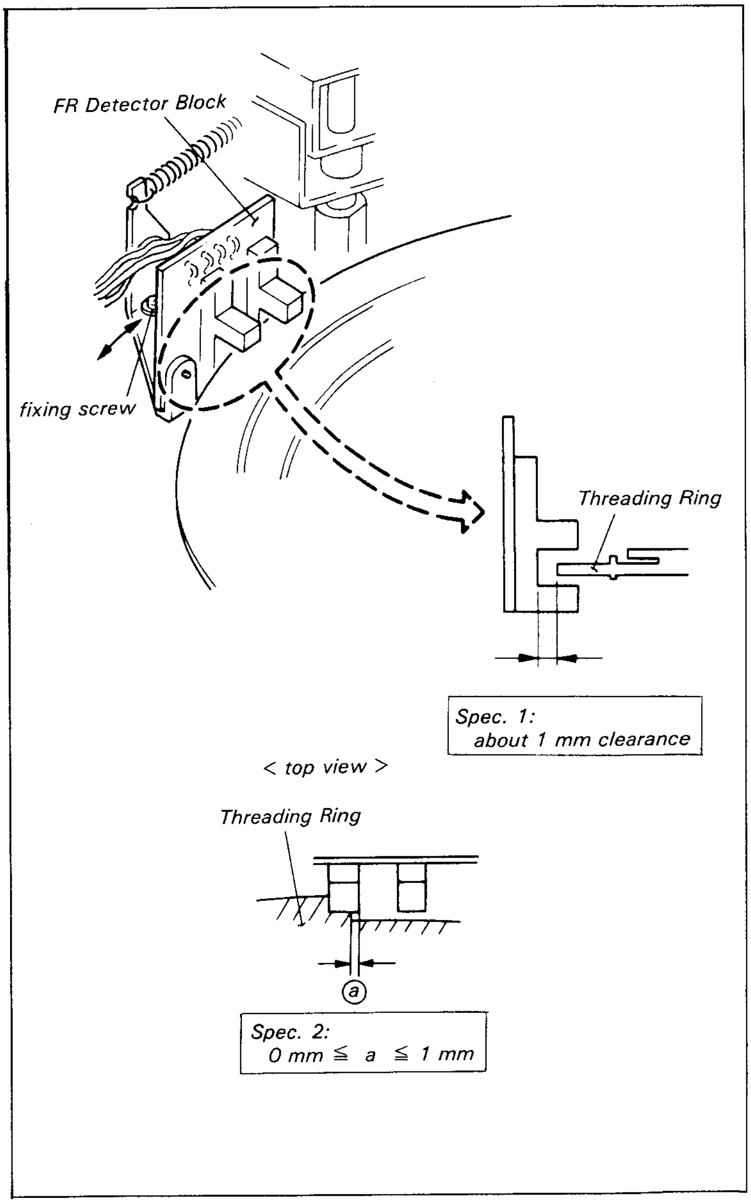
Adjustment procedure:

(1) Put the unit into the THREADING completion mode and turn the power OFF.

(2) Press the FR Detector Block against the Threading Ring, and reverse it about 1mm. (Do not reverse it more than 1.5mm) (Spec.1)

(3) Adjust the position of the FR Detector Block in the direction of the arrow so that meets the required specification 2.

(4) Check that the clearance meets the required specification 1.


FR Detector Block
fixing screw
Threading Ring
Spec. 1:
about 1 mm clearance
< top view >
Threading Ring
ⓐ
Spec. 2:
0 mm ≦ a ≦ 1 mm

5-4. PINCH LEVER BLOCK ADJUSTMENT

5-4-1. Pinch Lever Preset Adjustment

- It is required that the Section 5-3-1, Threading Ring Rotation Adjustment and the Section 5-3-3, Pinch Roller Position Adjustment are correct before initiating this adjustment.

Mode: Turn the power OFF in the PLAY mode

Check procedure:

(1) Turn the power OFF in the PLAY mode. Check that the position of the Pinch Solenoid Pin meets the required specification.

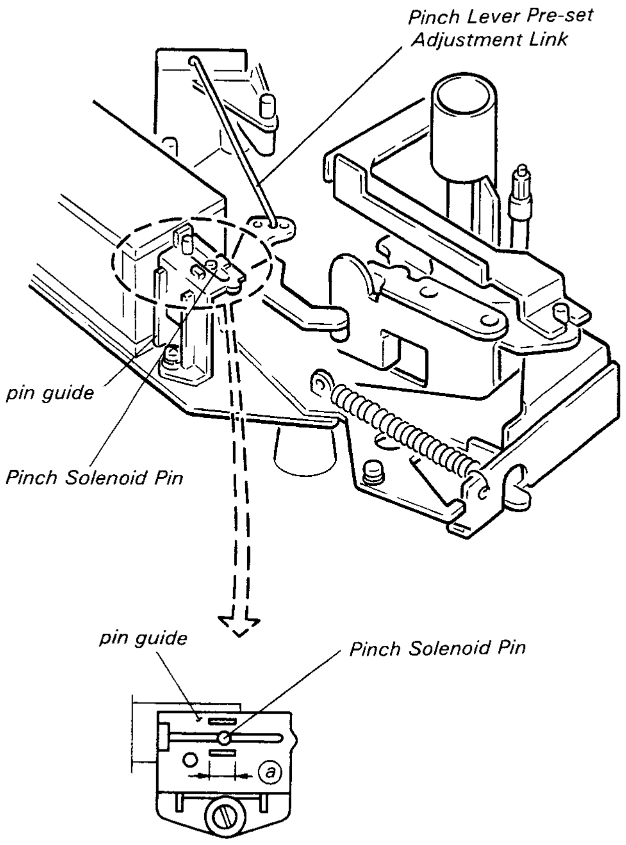
(2) Turn the power ON; press the PLAY button after unthreading. Check as described in procedure (1).

Adjustment procedure:

(1) Adjust the position of the Pinch Solenoid to meet the required specification, refer to Section 5-7-4, Pinch Mounting Position Adjustment.

(2) If does not meet the required specification in Step (1), adjust the position of the Sub Ring Stopper to meet the required specification, refer to Section 5-3-3, Pinch Roller Position Adjustment.

(3) If does not meet the required specification in Steps (1) and (2), insert the Pinch Lever Preset Adjustment Link into the proper hole of the Preset Lever Ass'y to meet the required specificaiton. Perform Steps (1) and (2) again.



Spec.:
The outer circumference of the Pinch Solenoid Pin is placed in the ⓐ portion of the pin guide.

5-4-2. Pinch Roller Pre-set Adjustment

- It is required that the Section 5-3-1, Threading Ring Rotation Adjustment and the Section 5-3-3, Pinch Roller Position Adjustment are correct before initiating this adjustment.

Mode: PLAY mode

Tool: Thickness gauge

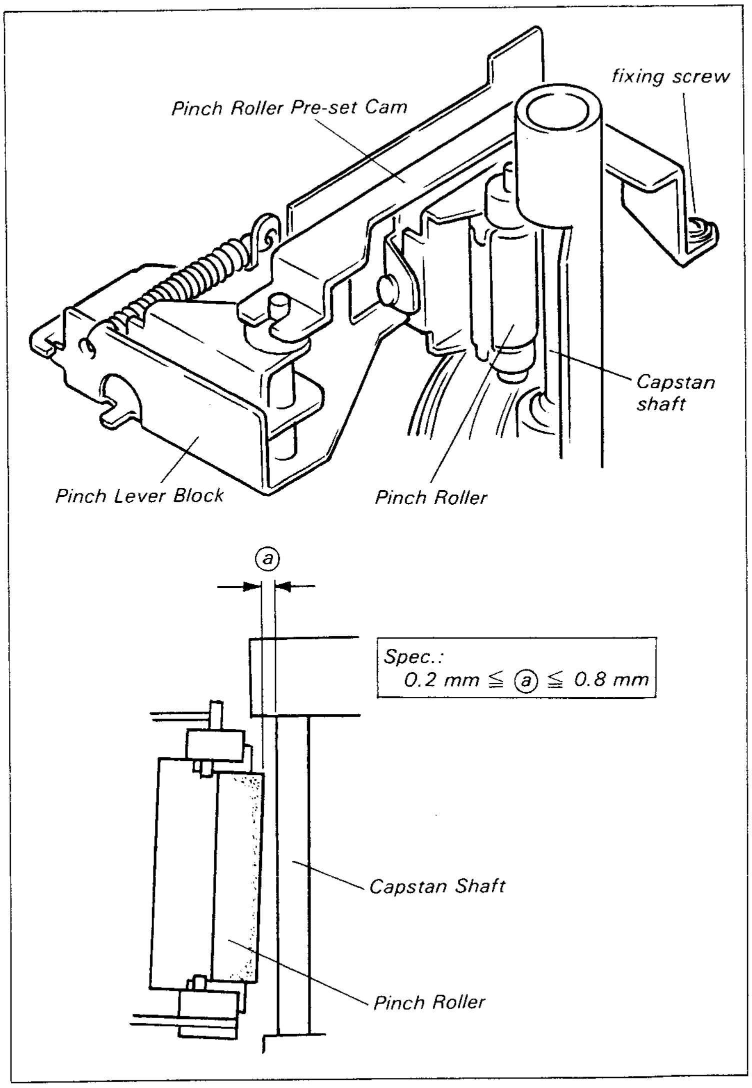
Check procedure:

(1) Check that the clearance between the Pinch Roller and the Capstan Shaft meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Preset Cam to meet the required specification.

(2) Repeat the unthreading and the threading modes two or three times and check that the clearance meets the required specification.


Pinch Roller Pre-set Cam
fixing screw
Capstan shaft
Pinch Lever Block
Pinch Roller
ⓐ
Spec.:
0.2 mm ≦ ⓐ ≦ 0.8 mm
Capstan Shaft
Pinch Roller

5-4-3. Pinch Solenoid Block Position Adjustment

Mode: PLAY mode

Tool: Thickness gauge

Check procedure:

(1) Insert the cassette tape and put the unit into the PLAY mode.

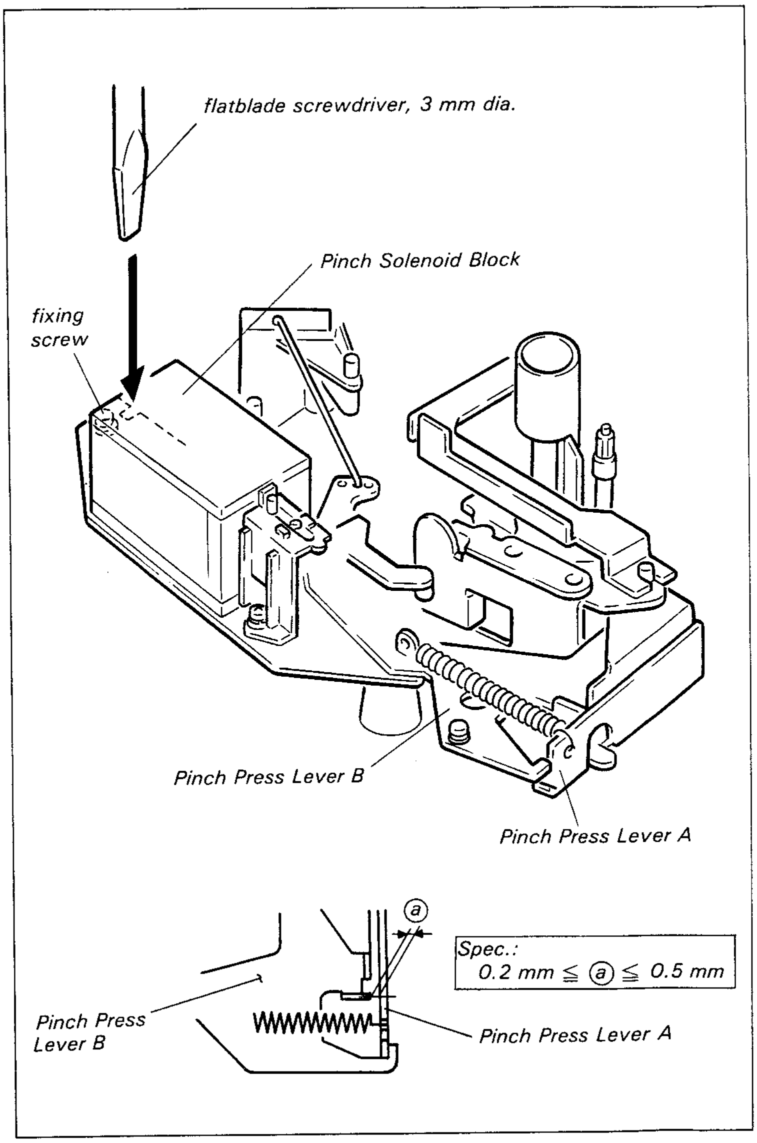
(2) Check that the clearance between Pinch Press Levers A and B meet the required specificaiton.

(3) Repeat the unthreading and the threading modes two or three times and check as described in procedure (2).

Adjustment procedure:

(1) Adjust the position of the Pinch Solenoid Block in the PLAY mode with a flatblade screwdriver (3mm dia.) to meet the required specification.

(2) Confirm as described in procedures (2) and (3).


flatblade screwdriver, 3 mm dia.
Pinch Solenoid Block
fixing screw
Pinch Press Lever B
Pinch Press Lever A
ⓐ
Spec.: 0.2 mm ≦ ⓐ ≦ 0.5 mm
Pinch Press Lever B
Pinch Press Lever A

5-5. T TAPE SENSOR POSITION ADJUSTMENT

- There are two adjustments of the height and the clearance between a tape and LED in this section.

Mode: Insert a tape and put the unit into the FR-STOP and PLAY modes.

Tool: Thickness gauge

Check procedure:

(1) Insert a cassette tape and put the unit into the FR-STOP mode. Push the tape against the cassette tape side with finger, as shown in the figure. Check that the clearance between the top edge of a tape and the bottom side of T Photo Holder Block (black plastic) meets the required specification. (Spec. (1))

(2) Put the unit into the PLAY mode.

(3) When viewing from the top of the unit, check that the ※ ※ marked portion of the T Tape Sensor Block is above the top flange portion of the T Tension Regulator Arm (as shown in figure "A"). (Spec. (2))

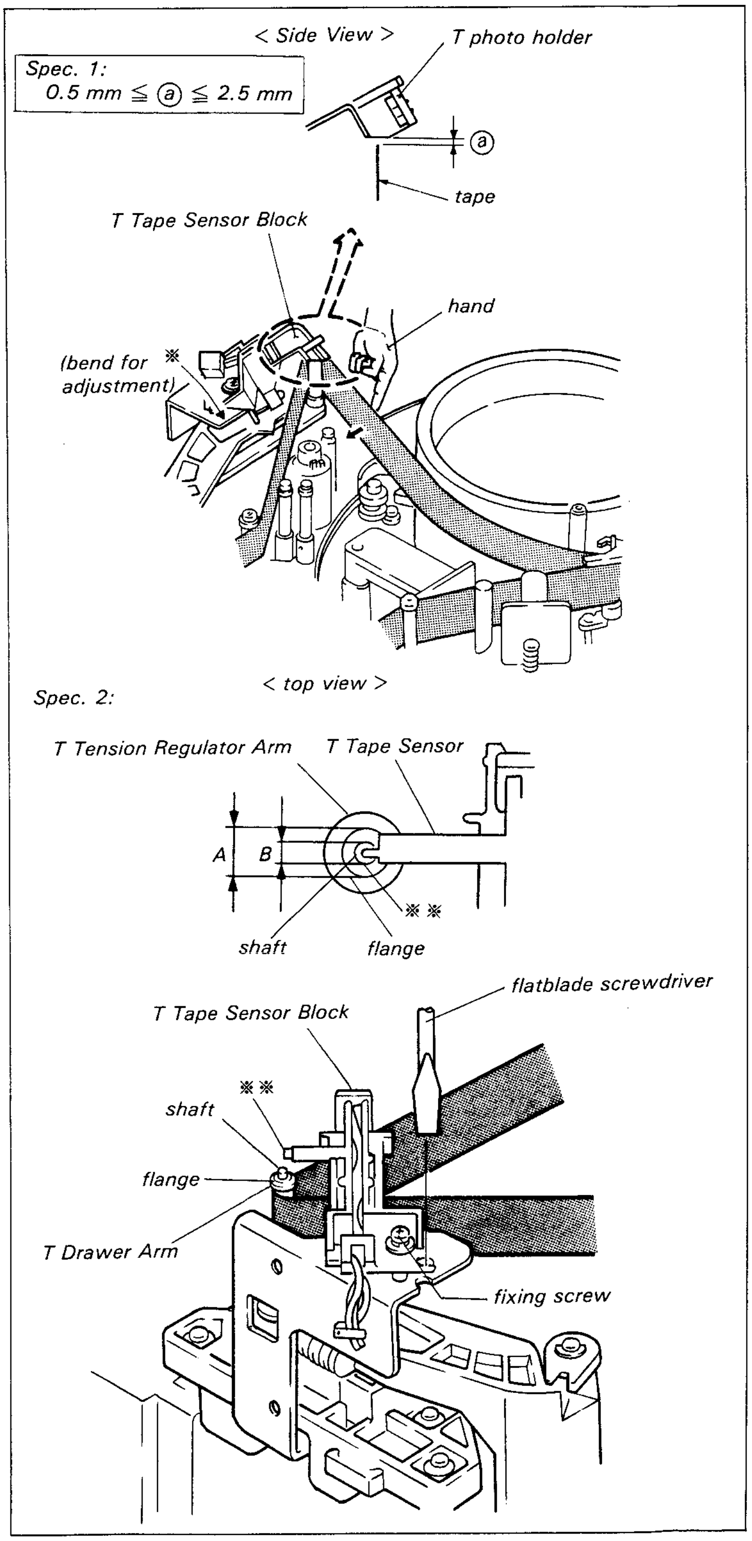
Adjustment procedure:

(1) Bend the ※ marked position with pliers so that it meets the required specification (1). Confirm as described in procedures (2) and (3).

(2) Loosen the fixing screw of the T Tape Sensor Block 1/2 to 1 turn.

(3) When viewing from the top of the unit, in the PLAY mode, adjust the position of the T Tape Sensor Block with a flatblade screwdriver so that the ※ ※ marked portion of the T Tape Sensor Block is above the shaft of the T Tension Regulator Arm (as shown in figure "B").

(4) Confirm as described in procedure (1).


< Side View >
T photo holder
Spec. 1:
0.5 mm ≦ ⓐ ≦ 2.5 mm
ⓐ
tape
T Tape Sensor Block
hand
(bend for ※
adjustment)
Spec. 2:
< top view >
T Tension Regulator Arm
T Tape Sensor
A
B
※※
shaft
flange
flatblade screwdriver
T Tape Sensor Block
※※
shaft
flange
T Drawer Arm
fixing screw

5-6. TENSION ARM SYSTEM ADJUSTMENT

5-6-1. S Drawer Roller Ass'y Limiter Adjustment

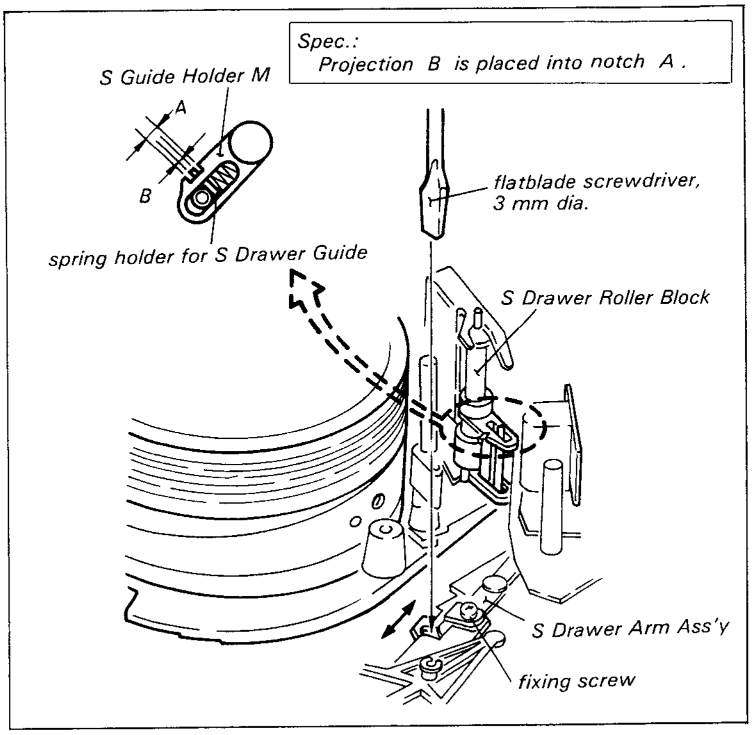
Mode: FR-STOP mode

Check procedure:

(1) Check that the B portion of the Spring Holder for the S Drawer Guide is placed into notch A of the S Guide Holder M.

Adjustment procedure:

(1) Adjust the position of the S Drawer Arm Ass'y with a flatade screwdriver (3mm dia.) so that it meets the required specification.


Spec.:
Projection B is placed into notch A .
S Guide Holder M
A
B
spring holder for S Drawer Guide
flatblade screwdriver, 3 mm dia.
S Drawer Roller Block
S Drawer Arm Ass'y
fixing screw

5-6-2. T Tension Regulator Operation Position Adjustment

Mode: FR-STOP mode

Tool: Thickness gauge

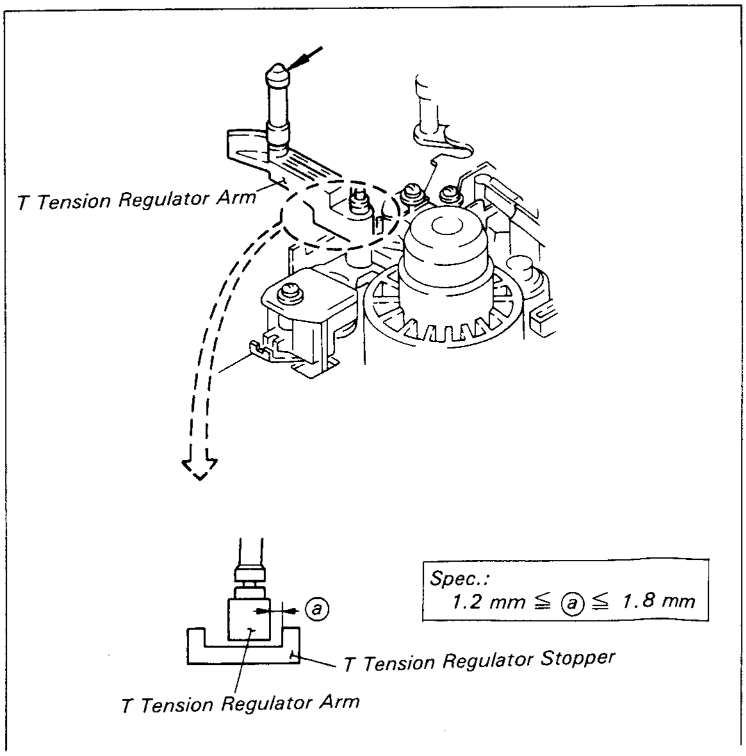
Check procedure:

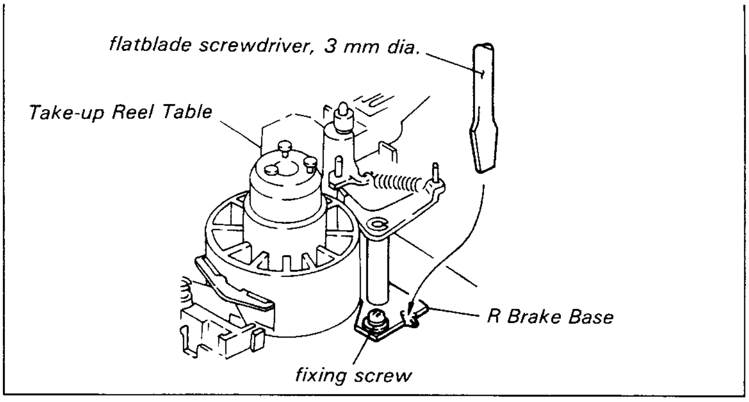
(1) Push the T Tension Regulator Arm lightly to the left with a finger as far as it will go (in the direction of the arrow); remove the finger gently.

(2) Check that the clearance between the T Tension Regulator Arm and the stopper meets the required specification.

Adjustment procedure:

(1) Adjust the position of the R Brake Lever with a flatblade screwdriver (3mm dia.) so that it meets the required specification.


Spec.:
1.2 mm ≦ ⓐ ≦ 1.8 mm
T Tension Regulator Arm
ⓐ
T Tension Regulator Stopper
T Tension Regulator Arm


flatblade screwdriver, 3 mm dia.
Take-up Reel Table
R Brake Base
fixing screw

5-6-3. S Tension Regulator Operating Position Adjustment

Mode: FF mode

Check procedure:

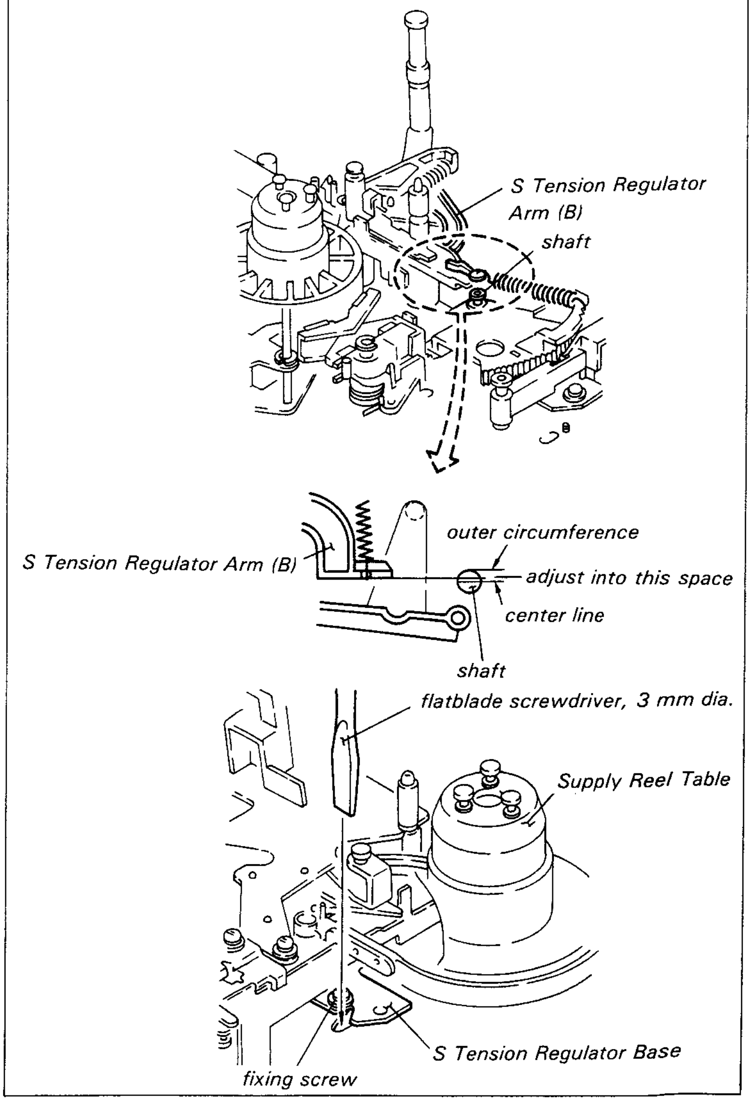
(1) Put the unit into the FF mode without a cassette tape.

(2) Check that the edge of the S Tension Regulator Arm (B) meets the required specification.

Adjustment procedure:

(1) Adjust the position of the S Tension Regulator Base so that it meets the required specification.

Spec.:
Edge of the S Tension Regulator Arm is between the center line and the outer circumference of the shaft.


S Tension Regulator Arm (B)
shaft
outer circumference
S Tension Regulator Arm (B)
adjust into this space
center line
shaft
flatblade screwdriver, 3 mm dia.
Supply Reel Table
S Tension Regulator Base
fixing screw

5-6-4. Tension Detector Position Adjustment

Mode: FWD/REV mode

Tool: DC voltmeter

Preparation:

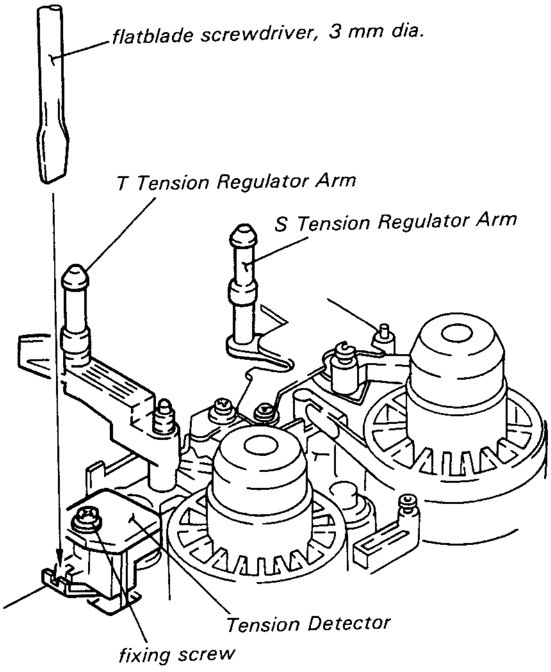
(1) Connect the dc voltmeter to TP1 on the SY-51 Board.

Check procedure:

(1) Put the unit into the FWD mode without a cassette tape.

(2) Push the T Tension Regulator Arm to the right with a finger as far as it will go. Check that the dc voltage is more than 8V.

(3) Push the T Tension Regulator Arm to the left with a finger as far as it will go. Check that the dc voltage is less than 2.5V.


flatblade screwdriver, 3 mm dia.
T Tension Regulator Arm
S Tension Regulator Arm
Tension Detector
fixing screw

5-7. SOLENOID SYSTEM ADJUSTMENT

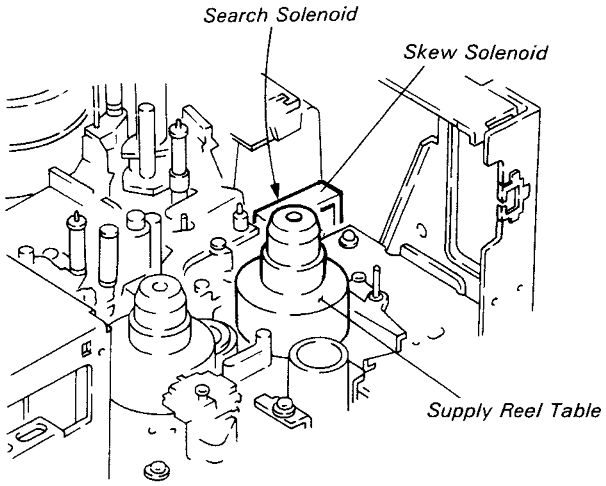
5-7-1. Search Solenoid Mounting Position Adjustment

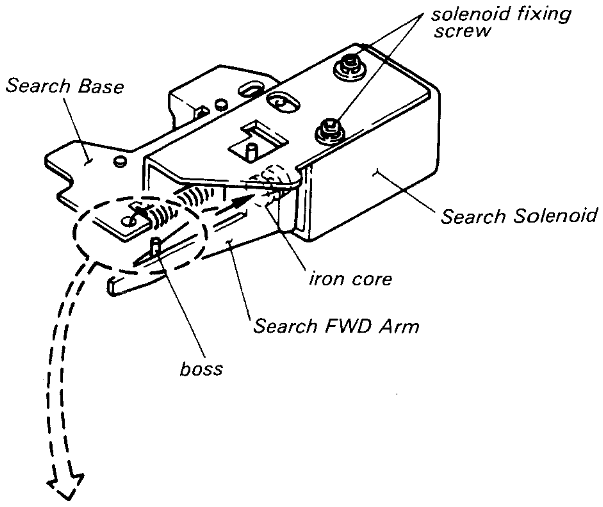
. This adjustment is usually not required. Proceed with the following step only when the Search Solenoid is replaced or removed.

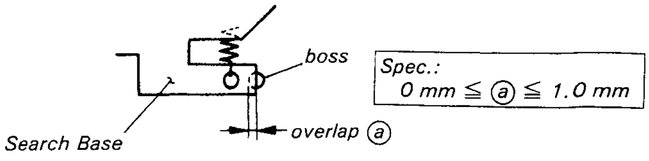
Mode: Remove the Search Solenoid Block from the chassis.

Adjustment procedure:

(1) Move the iron core into the fully energized position (as far as it will go in the direction of the arrow). Adjust the mounting position of the Search Solenoid so that the overlap of the Search FWD Arm Boss and the Search Base meets the required specification.


Search Solenoid
Skew Solenoid
Supply Reel Table


solenoid fixing screw
Search Base
Search Solenoid
iron core
Search FWD Arm
boss


boss
Search Base
overlap ⓐ
Spec.:
0 mm ≦ ⓐ ≦ 1.0 mm

5-7-2. T Idler Solenoid Position Adjustment

. This adjustment is performed when T Idler Solenoid is replaced or removed, and the F.FWD Torque does not meet the required specification.

Mode: F.FWD mode without a cassette tape

Adjustment procedure:

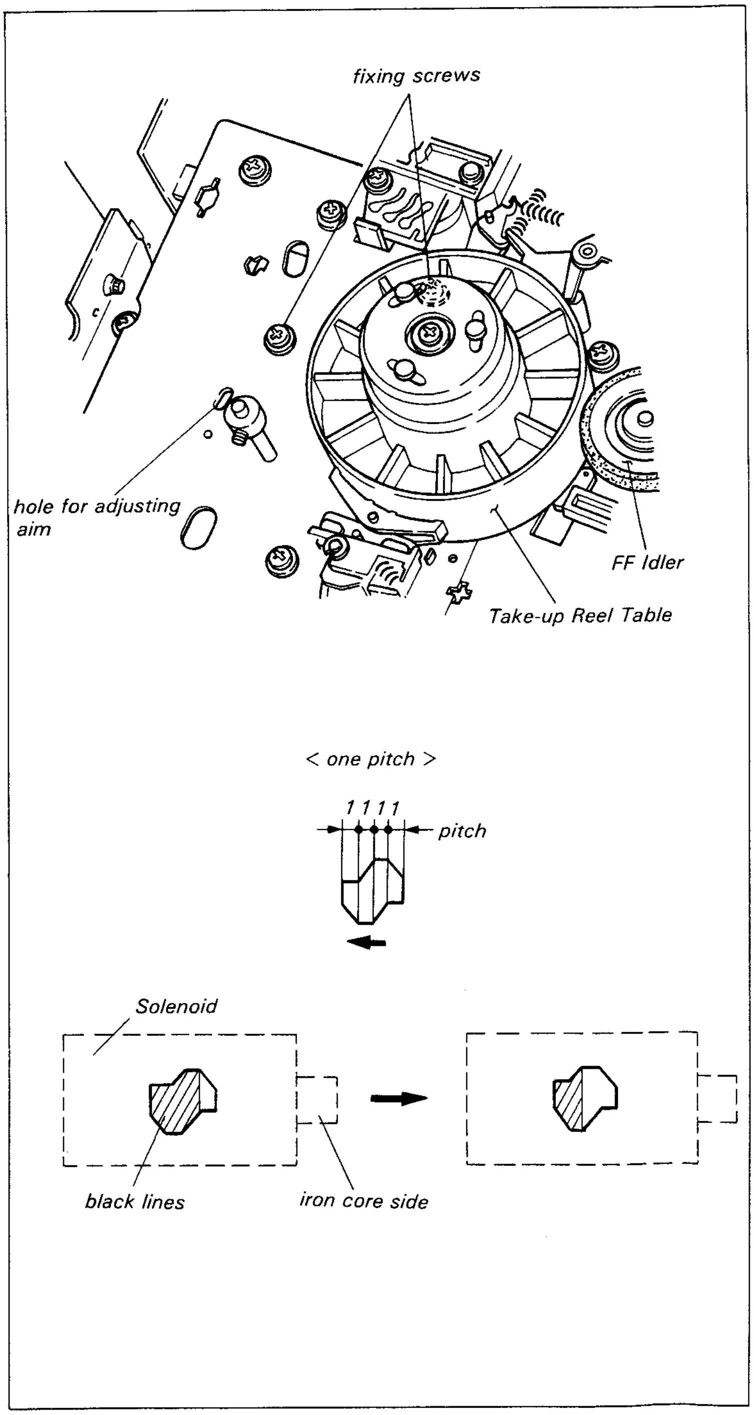
(1) Put the unit into the F.FWD mode without a cassette tape.

(2) Loosen the fixing screws of the T Idler Solenoid about 1/2 turn.

(3) Adjust the position of the T Idler Solenoid so that 0.01 mm to 0.1 mm clearance exists between the Take-up Reel Table and the FF Idler.

(4) Note the hole provided for adjusting the aim after completing procedure (3). Confirm the position of the black lines of this Solenoid in this hole.

(5) Move the Solenoid in the direction of the arrow only one pitch from the position of procedure (4). Tighten the fixing screws.


fixing screws
hole for adjusting aim
FF Idler
Take-up Reel Table
< one pitch >
1 1 1 1
pitch
Solenoid
black lines
iron core side

5-7-3. S Idler Solenoid Position Adjustment

- This adjustment is required only when the Supply Idler Solenoid is replaced or removed, and the REW Torque does not meet the required specification.

Mode: REW mode without a cassette tape

Adjustment procedure:

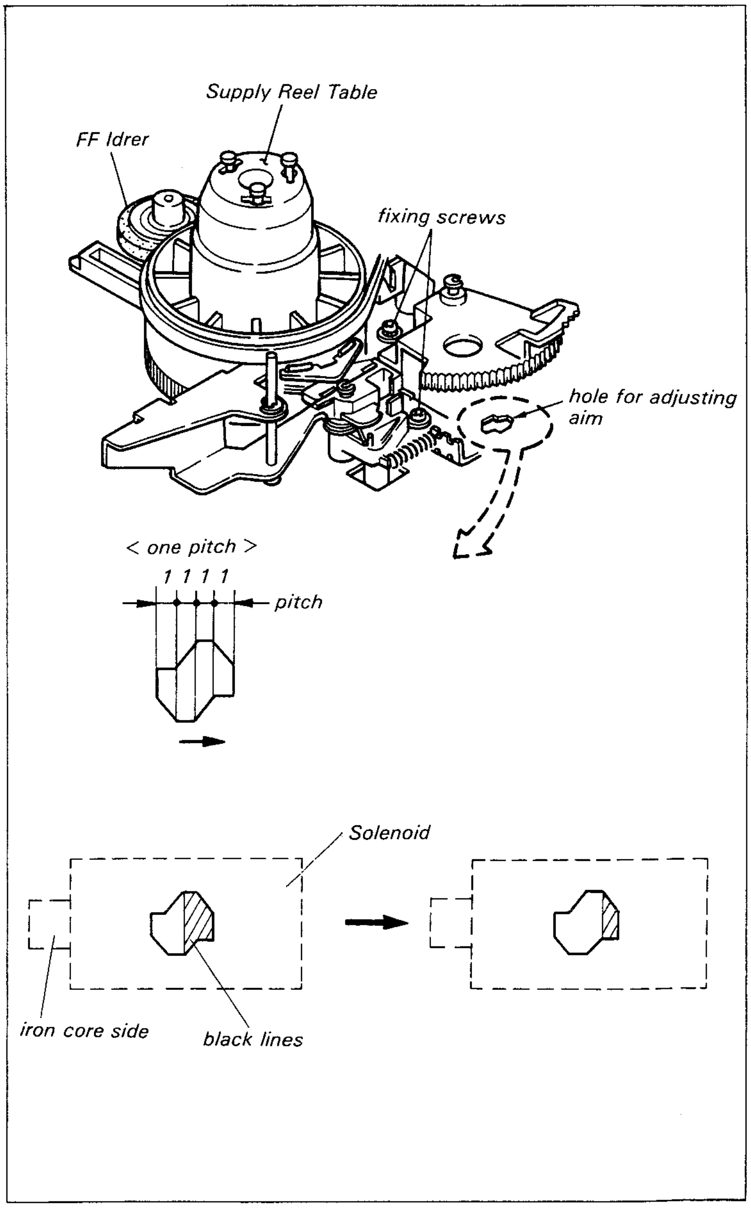
(1) Put the unit into the REW mode without a cassette tape.

(2) Loosen the fixing screws of the Supply Idler Solenoid about 1/2 turn.

(3) Adjust the position of the S Idler Solenoid so that 0.01 mm to 0.1 mm clearance exists between the Supply Reel Table and the FF Idler.

(4) Note the hole provided for adjusting the aim after completeing procedure (3). Confirm the position of the black lines of this Solenoid in this hole.

(5) Move the Solenoid in the direction of the arrow only one pitch from the position of procedure (4). Tighten the fixing screws.


Supply Reel Table
FF Idrer
fixing screws
hole for adjusting aim
< one pitch >
1 1 1 1
pitch
Solenoid
iron core side
black lines

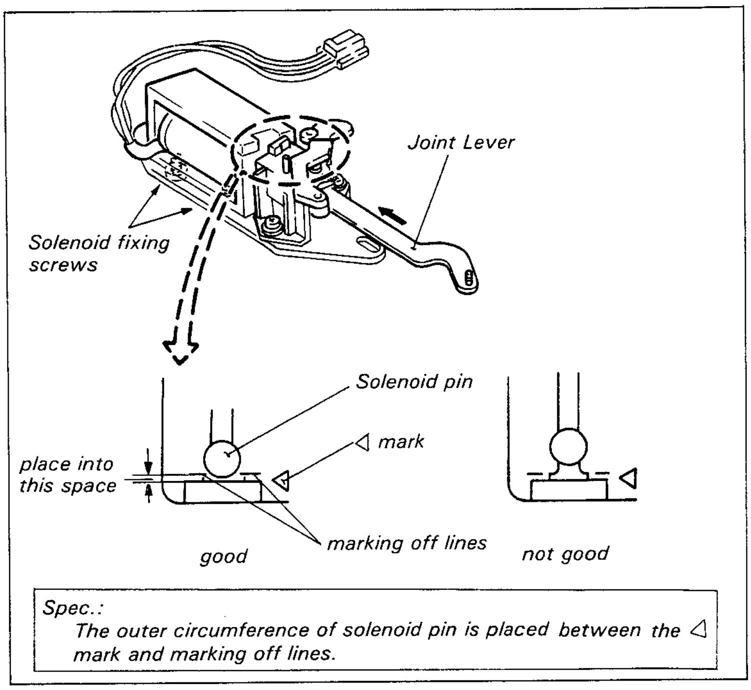
5-7-4. Pinch Solenoid Mounting Position Adjustment

- This adjustment is usually not required. Proceed with the following step only when the Pinch Solenoid is replaced or removed.

Mode: Remove the Pinch Solenoid Block from the chassis.

Adjustment procedure:

(1) When the iron core of the solenoid is in the fully eneregized position moving the Joint Lever in the direction of the arrow, adjust the solenoid mounting position so that the outer circumference of Solenoid Pin meets the required specification.


Joint Lever
Solenoid fixing screws
Solenoid pin
◁ mark
place into this space
marking off lines
good
not good

Spec.:
The outer circumference of solenoid pin is placed between the ◁ mark and marking off lines.

5-7-5. T Brake Solenoid Position Adjustment

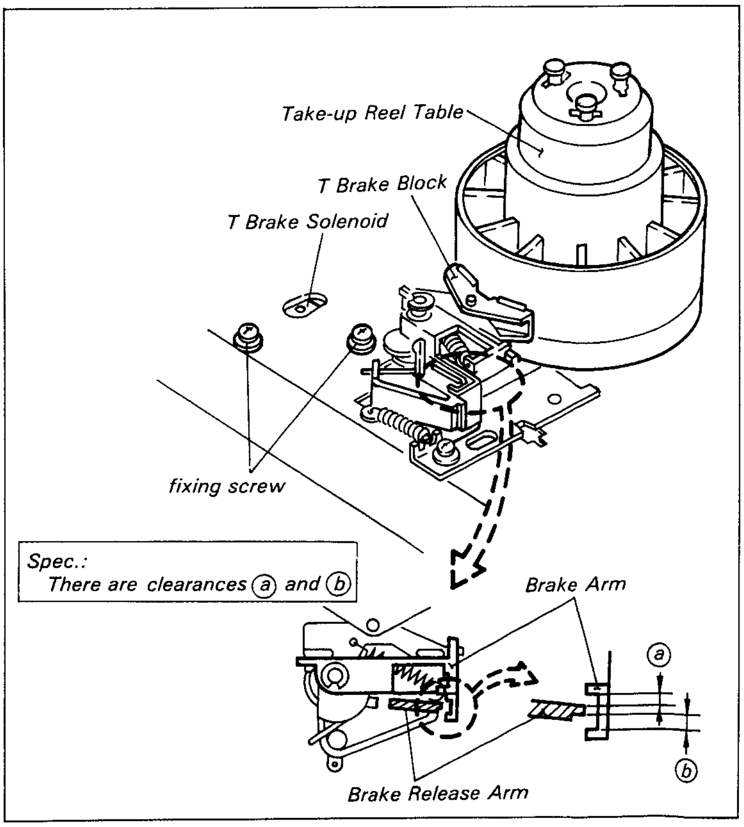
Mode: REW mode without cassette tape

Check procedure:

(1) Check that the positional relationship between the Brake Release Arm and the Brake Arm meets the required specification.

Adjustment procedure:

(1) Adjust the position of the T Brake Solenoid to meet the required specification.


Take-up Reel Table
T Brake Block
T Brake Solenoid
fixing screw
Brake Arm
ⓐ
ⓑ
Brake Release Arm

Spec.:
There are clearances ⓐ and ⓑ

5-7-6. S Brake Solenoid Position Adjustment

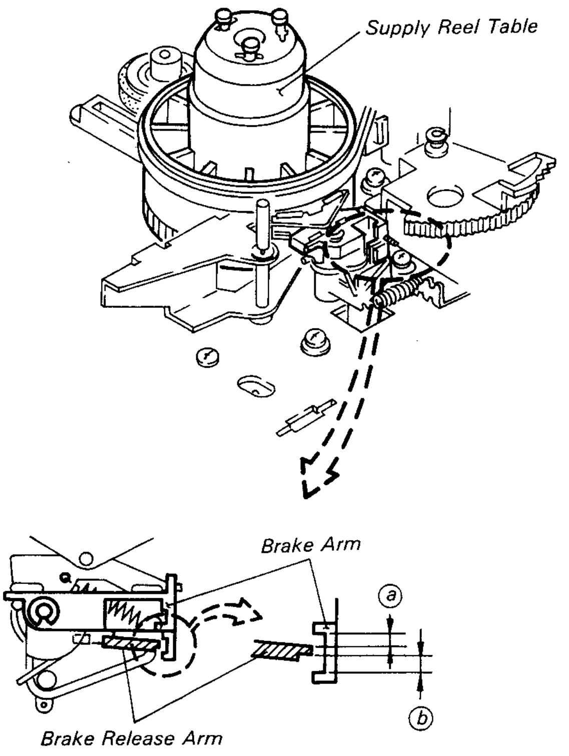
Mode: REW mode without cassette tape

Check procedure:

(1) Check that the positional relationship between the Brake Release Arm and the Brake Arm meets the required specification.

Adjustment procedure:

(1) Adjust the position of the S Brake Solenoid to meet the required specification.


Supply Reel Table
Brake Arm
ⓐ
ⓑ
Brake Release Arm

Spec.:
There are clearances ⓐ and ⓑ

5-8. CASSETTE-UP COMPARTMENT ADJUSTMENT

- The Cassette-up Compartment has two photo-electrical switches. The ON/OFF timing of these switches is adjusted as follows.
- Remove the Cassette-up Compartment from the unit in this adjustment.

5-8-1. Cassette-in Switch Position Adjustment

Tool: KCA type cassette tape
Circuit tester
Thickness gauge

Preparation:

(1) Connect the plug of the harness for the Cassette-up Compartment and the terminal on the CC-22 Board with the jumper leads as follows:

plug of harness (CN1)	terminal on CC-22 Board
4 pin (5V) ←	→ 4 pin/CN1
5 or 2 pin (GND) ←	→ 5 or 2 pin/CN1

(2) Turn the power ON.

Check procedure:

(1) Connect the circuit tester to 1 terminal on CC-22 Board.

(2) Insert a KCA type cassette tape slowly.

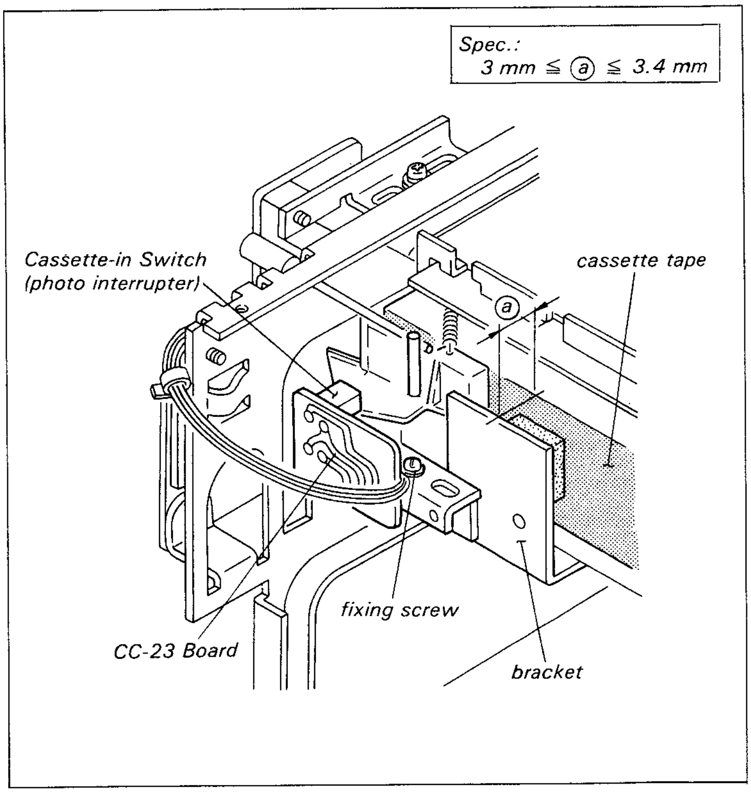
(3) When the circuit tester turns to "H" (about 5V), check that the clearance between the front side of the cassette tape and the bracket of the Cassette-up Compartment meets the required specification.

Adjustment procedure:

(1) Adjust the position of the cassette-in switch in the direction of the arrow to meet the required specification.

Adjusting procedure:

Insert a 3.3 mm thick thickness gauge between the cassette tape and the bracket. Adjust the position of the cassette-in switch so that the circuit tester turns to "H" in this position.



5-8-2. Cassette-down Switch Position Adjustment

Tool: Circuit tester

Preparation:

(1) Connect the plug of the harness for the Cassette-up Compartment and the terminal on the CC-22 Board with the jumper leads as follows:

plug of harness (CN1)	terminal on CC-22 Board
4 pin (5V) ⟶	4 pin/CN1
5 or 2 pin (GND) ⟶	5 or 2 pin/CN1

(2) Turn the power ON.

Check procedure:

(1) Connect the circuit tester to 5 terminal on CC-22 Board.

(2) Turn the white gear on the right side of the Cassette-up Compartment in the clockwise direction.

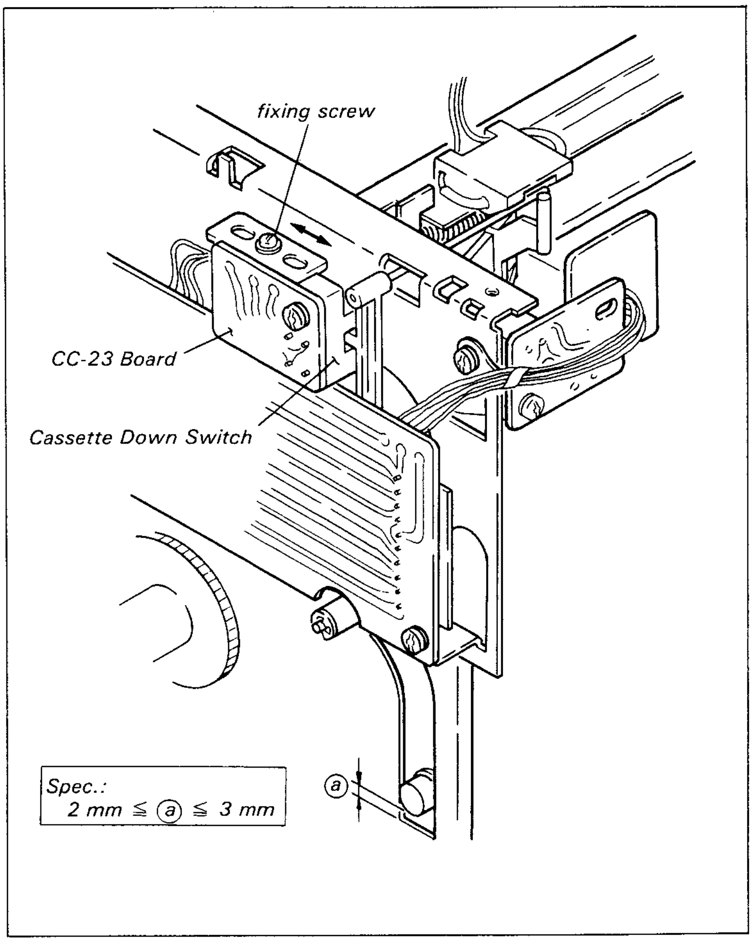
(3) Check that the clearance between the roller and the guide meets the required specificaiton.

Adjustment procedure:

(1) Adjust the position of the cassette-down switch in the direction of the arrow to meet the required specification.

Adjusting procedure;

Turn the gear on the right side so that the clearance between the roller and the guide is 2.2 mm. Adjust the position of the cassette-down switch so that the circuit tester turnes to "H" in this position.



Spec.:
2 mm ≦ ⓐ ≦ 3 mm

5-9. LEAF SPRING POSITION ADJUSTMENT

Check procedure:

(1) Put the unit into the EJECT mode after first placing it into the PLAY mode.

(2) Turn the Gear Box Pulley by hand so that the edge of the T Drawer Arm is at the center of the shaft as shown in the figure.

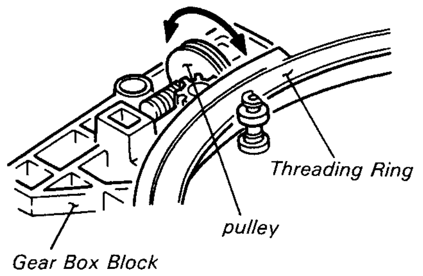
(3) Check that the clearance between the Leaf Spring and the Pinch Roller Shaft meets the required specificaiton (1).

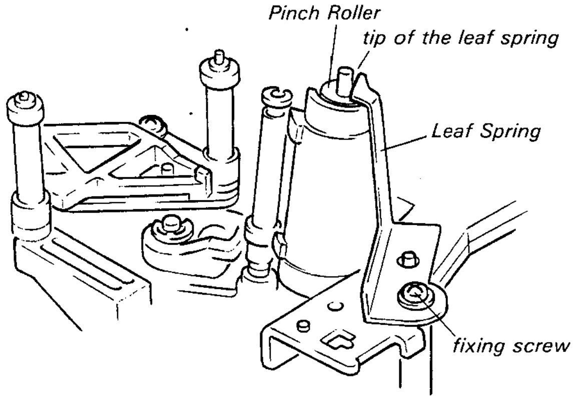
(4) Put the unit into the EJECT completion mode after placing it into the PLAY mode again.

(5) Check that the Leaf Spring touches the Pinch Roller Shaft, and the clearance between the Leaf Spring and the Pinch Roller meets the required specification (2).

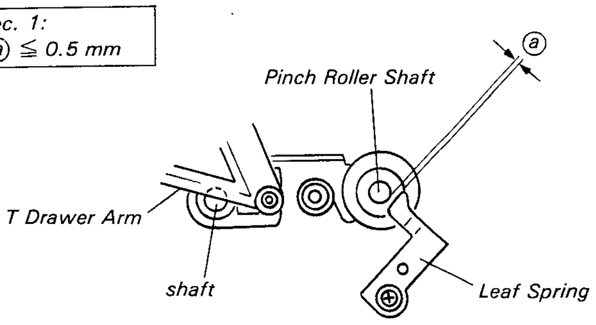
Adjustment procedure:

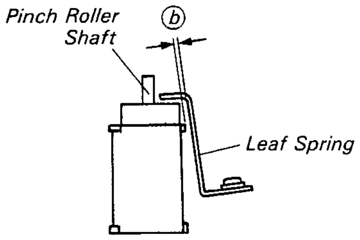
(1) Adjust the position of the Leaf Spring to meet the required specifications (1) and (2).


Threading Ring
pulley
Gear Box Block


Pinch Roller
tip of the leaf spring
Leaf Spring
fixing screw

Spec. 1:
ⓐ ≦ 0.5 mm


ⓐ
Pinch Roller Shaft
T Drawer Arm
shaft
Leaf Spring


Pinch Roller Shaft
ⓑ
Leaf Spring

Spec. 2:
There is clearance ⓑ.

5-10. PINCH LEVER RIGHT ANGLE ADJUSTMENT

- This adjustment is precisely factory-calibrated before shipment so that no adjustment is required except for the Pinch Lever and the Capstan Shaft replacement.

Mode: Unthreading end/POWER OFF

Tool: Flatness Plate

Check procedure:

(1) Remove the Pinch Roller Pre-set Cam.

(2) Set the Flatness Plate to the Capstan Shaft as shown in the figure.

(3) Push the Pinch Lever in the direction of the arrow, so that upper portion the Pinch Press Plate contact to the Flatness Plate.

(4) Check that the lower clearances of the Pinch Press Plate and the Flatness Plate meet the required specification.

Adjustment procedure:

(1) Loosen the two fixing screws of the Pinch Press Adjusting Plate.

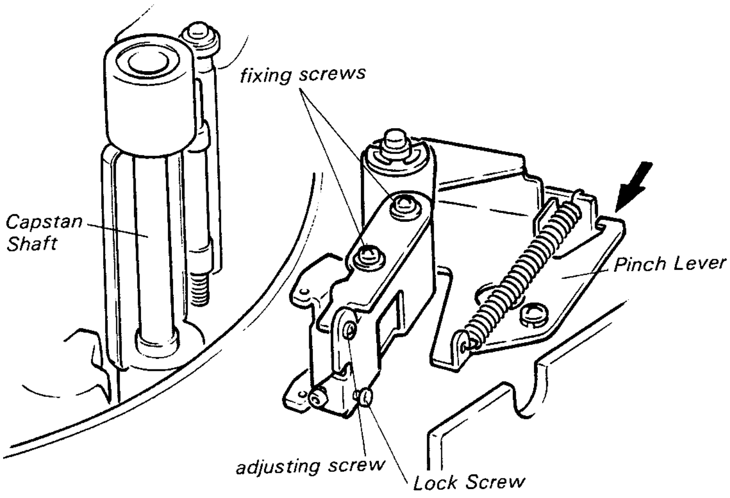
(2) When pushing the Pinch Lever in the direction of the arrow, adjust it with the adjusting screw to meet the required specification.

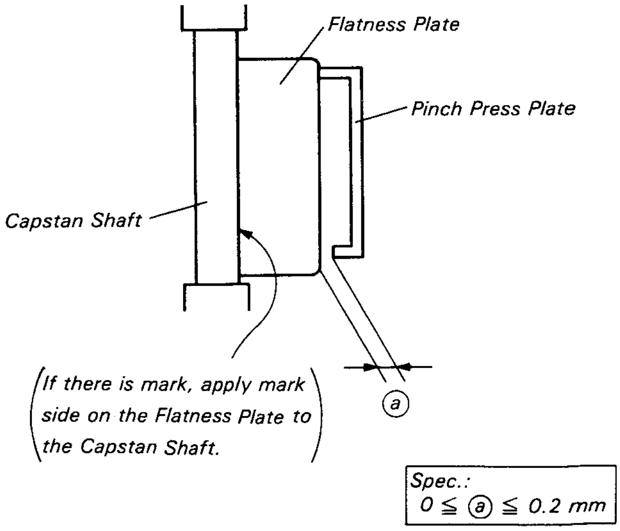
(3) After adjustment, tighten the two fixing screws of the Pinch Press Adjusting Plate.

(4) Turn the adjusting screw 1/2 turn in the clockwise direction.

(5) Confirm as described in the check procedures.

(6) Apply a locking compound to the adjusting screw.


fixing screws
Capstan Shaft
Pinch Lever
adjusting screw
Lock Screw


Flatness Plate
Pinch Press Plate
Capstan Shaft
If there is mark, apply mark side on the Flatness Plate to the Capstan Shaft.
ⓐ
Spec.:
0 ≦ ⓐ ≦ 0.2 mm

SECTION 6

BACK TENSION AND TORQUE ALIGNMENT

6-1. BRAKE SYSTEM ADJUSTMENT

6-1-1. S Brake Torque Adjustment

Mode: EJECT completion/the power OFF

Tool: Reel table torque measurement tape (100 mm dia.)
Tension scale (200 g full scale)

Check procedure:

(1) Grasp the top of the Supply Reel Table. While turning it in the clockwise direction approx. 30 degrees, check that the clearance between the Brake Arm and the Lining Holder meets the required specification (1) as shown in the figure.

(2) Install the jig tape on the Supply Reel Table and hook a tension scale onto an end of the jig tape. Pull out the tape at a constant speed of approx. 9.5cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification (2).

Adjustment procedure:

For Spec. (1)

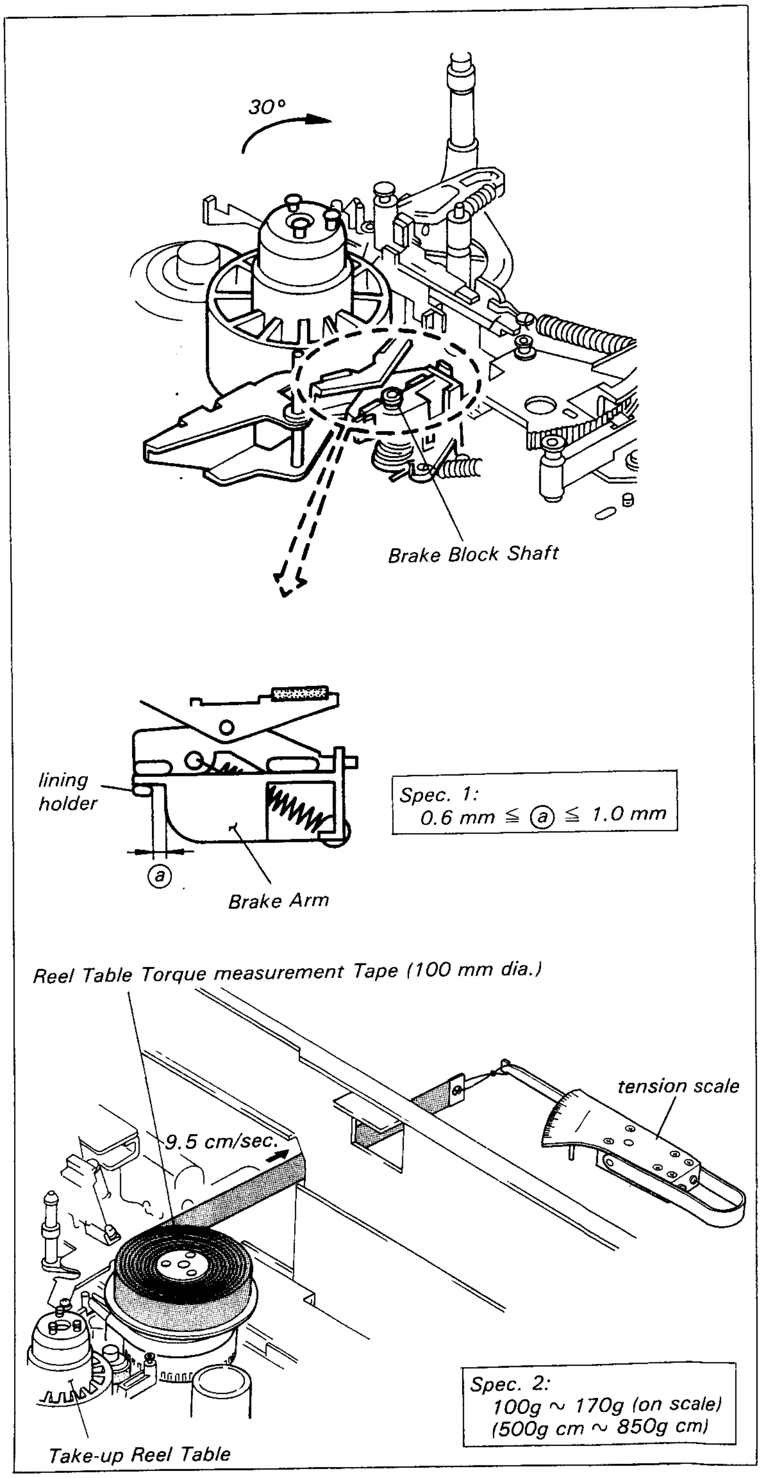
(1) Bend the Brake Block Shaft toward the Reel Table (or the opposite direction) by hand.

For Spec. (2)

(2) Clean the surface of the Reel Table with a cloth moistened with cleaning fluid.

(3) If does not meet the specification (2), replace the Lining Holder and check again.

(4) If does not meet the specification in Step (3), replace the Reel Table and check again.


30°
Brake Block Shaft
lining holder
ⓐ
Brake Arm
Spec. 1:
0.6 mm ≦ ⓐ ≦ 1.0 mm
Reel Table Torque measurement Tape (100 mm dia.)
9.5 cm/sec.
tension scale
Spec. 2:
100g ~ 170g (on scale)
(500g cm ~ 850g cm)
Take-up Reel Table

6-1-2. T Brake Torque Adjustment

Mode: EJECT completion/the power OFF

Tool: Reel table torque measurement tape (100 mm dia.)
Tension scale (200 g full scale)

Check procedure:

(1) Grasp the top of the Take-up Reel Table. While turning it in the clockwise direction approx. 30 degrees, check that the clearance between the Brake Arm and the Lining Holder meets the required specification (1) as shown in the figure.

(2) Install the jig tape on the Take-up Reel Table and hook a tension scale onto an end of the jig tape. While pushing the T Tension Regulator Arm to the left as far as it will go, pull out the tape at a constant speed of approx. 9.5cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification (2).

Adjustment procedure:

For Spec. (1)

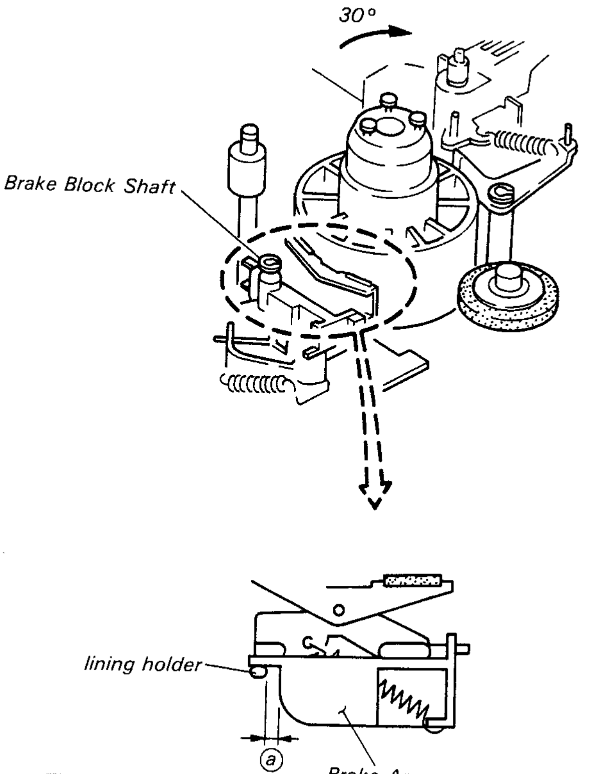
(1) Bend the Brake Block Shaft toward the Reel Table (or the opposite direction) by hand.

For Spec. (2)

(2) Clean the surface of the Reel Table with a cloth moinstened with cleaning fluid.

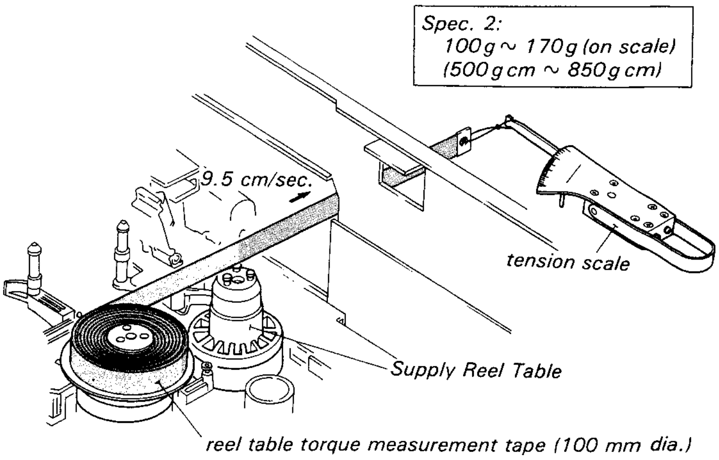
(3) If does not meet the specification (2), replace the Lining Holder and check again.

(4) If does not meet the specification in Step (3), replace the Reel Table and check again.


30°
Brake Block Shaft
lining holder
ⓐ
Brake Arm

Spec. 1:
0.6 mm ≦ ⓐ ≦ 1.0 mm

Spec. 2:
100g ~ 170g (on scale)
(500g cm ~ 850g cm)


9.5 cm/sec.
tension scale
Supply Reel Table
reel table torque measurement tape (100 mm dia.)

6-1-3. REW Brake Torque Adjustment

Mode: REW mode

Tool: Reel table torque measurement tape
(100 mm dia.)
Tension scale (50 g full scale)

Check procedure:

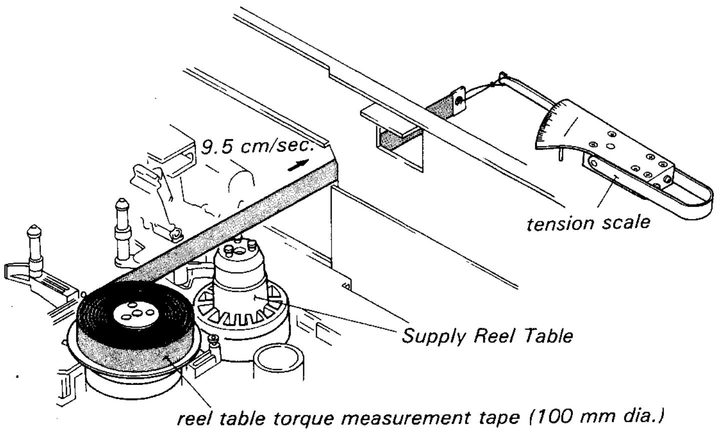
(1) Install the jig tape on the Take-up Reel Table and hook a tension scale onto an end of the jig tape.

(2) Put the machine into the REW mode. Pull out the tape at a constant speed of approx. 9.5cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

Adjustment procedure:

(1) If does not meet the specification, replace the R Brake Ass'y and check again.

(2) If does not meet the specification in Step (1), replace the Reel Table and check again.


9.5 cm/sec.
tension scale
Supply Reel Table
reel table torque measurement tape (100 mm dia.)

Spec.:
18g ~ 36g (on scale)
(90g · cm ~ 180g · cm)

6-2. FF/REW TORQUE ADJUSTMENT

- It is required that the Section 5-7-2, T Idler Solenoid Position Adjustment and Section 5-7-3, S Idler Solenoid Position Adjustment are correct before initiating this adjustment.

Mode: FF and REW modes

Tool: Reel table torque measurement tape (100 mm dia.)
Tension scale (500 g full scale)

Check procedure:

FF Torque

(1) Install the jig tape on the Take-up Reel Table and hook a tension scale onto an end of the tape. Pull out the tape.

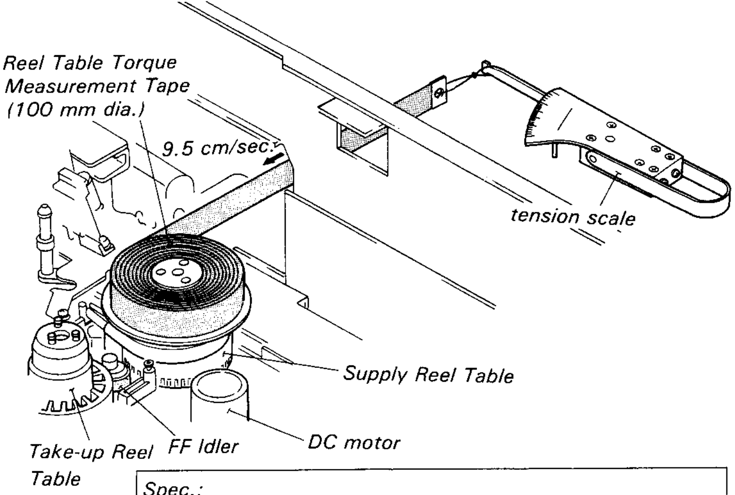
(2) Put the unit into the FF mode. Let the tape be pulled at a constant speed of approx. 9.5cm/sec. Check that the scale reading meets the required specification.

REW Torque

(3) Install the jig tape on the Supply Reel Table and hook a tension scale onto an end of the tape. Pull out the tape.

(4) Put the unit into the REW mode. Let the tape be pulled at the constant speed of approx. 9.5cm/sec. Check that the scale reading meets the required specification.

< REW torque measurement method >



Spec.:
FF Torque and REW Torque higher than 300g (on scale)
(higher than 1500g · cm)

Adjustment procedure:

Both FF Torque and REW Torque are adjusted by the following adjustment procedures.

(1) Clean the surface of the Reel Table, FF idler and belt with a cloth moistened with cleaning fluid. Check the torque again.

(2) If Step (1) does not meet the specification, put the unit into FF or REW mode without a cassette tape and check that the dc voltage at the terminals of the dc motor is 10.5 ± 1.5V in the FF or REW mode. If the dc voltage is out of specification, check that the circuit operation of the SY Board operates correctly.

(3) If does not meet the specification in Steps (1) and (2), replace the Reel Table, FF idler and belt.

6-3. FWD TORQUE ADJUSTMENT

Mode: 1/2 FWD SEARCH mode

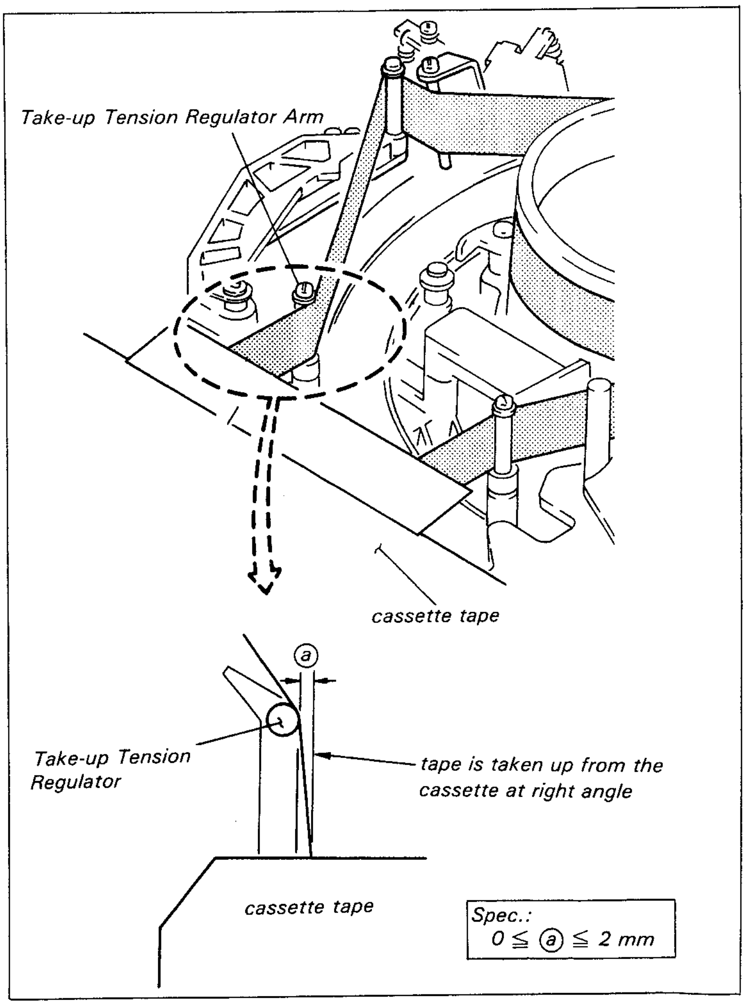
Check procedure:

(1) Insert a KCS-20 cassette tape wound to the tape end portion.

(2) Short between TP18 and GND on the SV-74 Board with a shorting clip. Put the unit into the FWD SEARCH mode. Check that the positional relationship between the T Tension Regulator Arm and cassette tape meets the required specification.

Adjustment procedure:

(1) Adjust RV3 on the SY-51 Board until it meets the required specification in the FWD mode.


Take-up Tension Regulator Arm
cassette tape
ⓐ
Take-up Tension Regulator
tape is taken up from the cassette at right angle
cassette tape

Spec.:
$0 \leqq ⓐ \leqq 2$ mm

6-4. REV TORQUE ADJUSTMENT

Mode: 1/2 REV SEARCH mode

Check procedure:

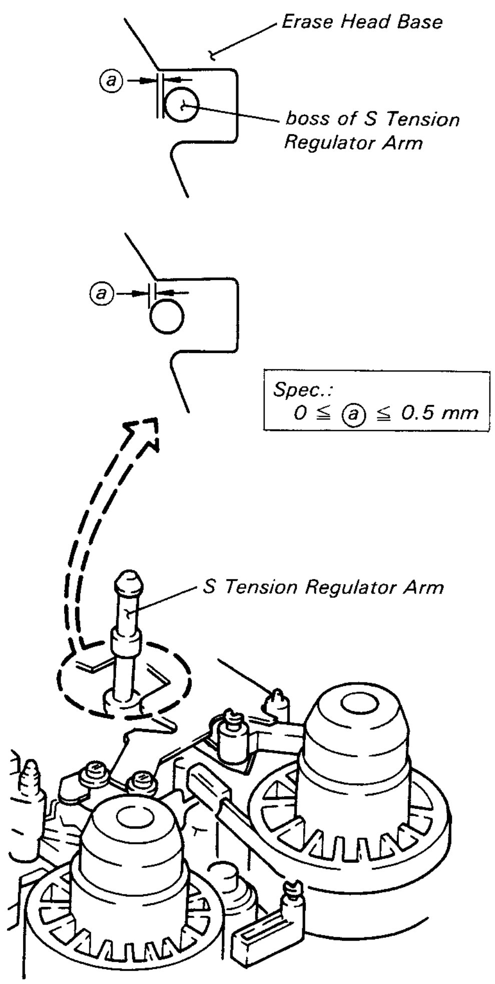
(1) Insert a KCA-60 cassette tape wound to the tape beginning portion.

(2) Short between TP18 and GND on the SV-74 Board with a shorting clip. Put the unit into the REV SEARCH mode.

(3) Check that the relationship between the boss of the S Tension Regulator and the bracket of the Erase Head Base until it meets the required specification.

Adjustment procedure:

(1) Adjust RV2 on the SY-51 Board until it meets the required specification.


Erase Head Base
ⓐ
boss of S Tension Regulator Arm
ⓐ
Spec.:
0 ≦ ⓐ ≦ 0.5 mm
S Tension Regulator Arm

6-5. FF BACK TENSION ADJUSTMENT

- It is required that the Section 5-6-3, Supply Tension Regulator Operating Position Adjustment is correct before initiating this adjustment.
- It is required that the Section 6-6, FWD Back Tension Adjustment is performed after this adjustment.

Tool: Back tension adjustment jig
Reel table torque measurement tape (100 mm dia.)
Tension scale (50 g full scale)

Preparation:

(1) Turn the power ON in the FR-STOP mode. (When the power is ON, the S Drawer Roller moves to the FR-STOP position and the unit automatically enters the FR-STOP mode.)

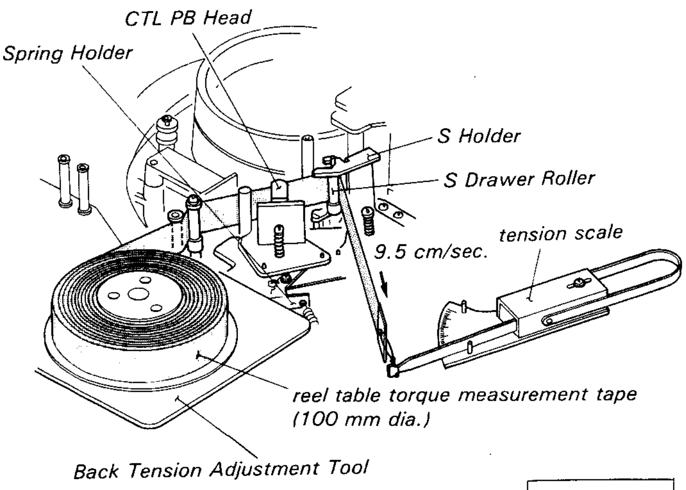
(2) Turn the Pulley of Gear Box Block by hand in the clockwise direction, as viewed from the Front Panel so that the S Drawer Roller is in front of the CTL PB Head.

(3) Install the Back Tension Adjustment Jig.

(4) Install the jig tape on the Supply Reel Table and install the tape as shown in the figure. Check that the tape does not curl at the flange of the S Drawer Roller.

(5) Turn the Pulley in the opposite direction in Step (2) so that the S Drawer Roller is engaged with the S Holder.

(6) Hook a tension scale onto an end of tape.


CTL PB Head
Spring Holder
S Holder
S Drawer Roller
tension scale
9.5 cm/sec.
reel table torque measurement tape (100 mm dia.)
Back Tension Adjustment Tool

Spec.:
40g ~ 47g
(on scale)

Check procedure:

(1) Press the FF button and put the unit into the FF mode.

(2) Pull out a tape at a constant speed of approx. 9.5cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Spring Holder with flatblade screwdrivers (3mm dia.) until it meets the required specification.

(2) After the adjustment, perform the check procedures again.

(3) Perform the Section 6-6, FWD Back Tension Adjustment.

6-6. FWD BACK TENSION ADJUSTMENT

- It is required that the Section 5-6-3, Supply Tension Regulator Operating Position Adjustment and the Section 6-5, FF Back Tension Adjustment are correct before initiating this adjustment.

Tool: Back tension adjustment jig
Reel table torque measurement tape (100 mm dia.)
Tension scale (100 g full scale)

Preparation:

(1) Push the Skew Lock Arm in the direction of the arrow.

(2) Turn the power ON, and put the unit into the FR-STOP mode. (When turning the power ON, the S Drawer Roller moves to the automatically FR-STOP position, and the unit enters the FR-STOP mode.)

(3) Turn the pulley of Gear Box Block by hand in the clockwise direction as viewed from the Front Panel so that the S Drawer Roller is in front of the CTL PB Head.

(4) Install the Back Tension Adjustment Jig.

(5) Install the jig tape on the Supply Reel Table and install the tape as shown in the figure. Check that the tape does not curl at the flange of the S Drawer Roller.

(6) Turn the Pulley in opposite direction in Step (3) so that the S Drawer Roller is engaged with the S Holder.

(7) Hook a tension scale onto an end of tape.

Check procedure:

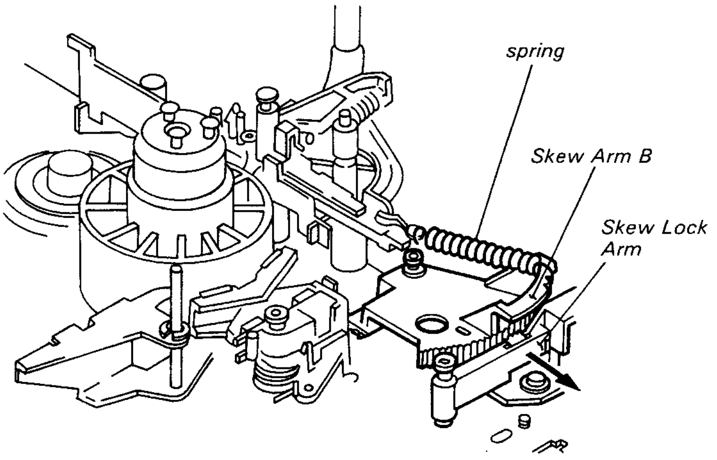
(1) Press the PLAY button and put the unit into the PLAY mode.

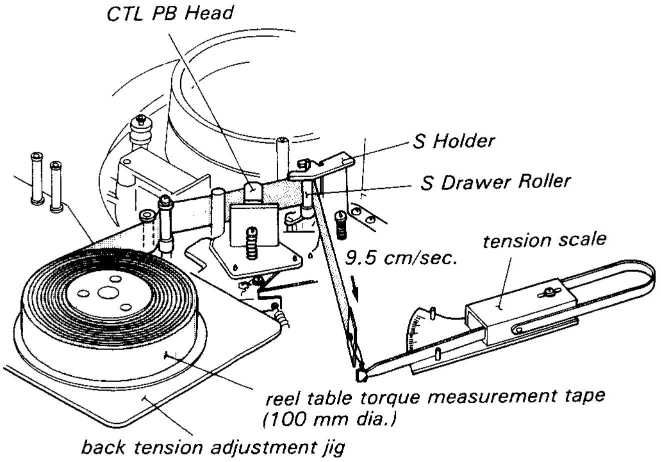
(2) Pull out the tape at a constant speed of approx. 9.5cm/sec. in the arrow direction. Check that the scale reading meets the required specification.

Adjustment procedure:

(1) Adjust the position of the proper spring hook of the Skew Arm B to meet the required specification.

(2) After adjustment, perform the check procedures again.




CTL PB Head
S Holder
S Drawer Roller
tension scale
9.5 cm/sec.
reel table torque measurement tape (100 mm dia.)
back tension adjustment jig

Spec.:
70g ∼ 75g (on scale)

SECTION 7

TAPE RUN ALIGNMENT

7-1. FF/REW MODES TAPE PATH ADJUSTMENT

Mode: FF and REW modes

Check procedure:

(1) Inserat a KCA-60 cassette tape (use the middle portion of the tape). Put the unit into the REW mode.

(2) Observe the surface of the running tape very carefully around T Drawer Arm. Check that the tape tension is exactly equal at the top and bottom of the tape. (Spec.1)

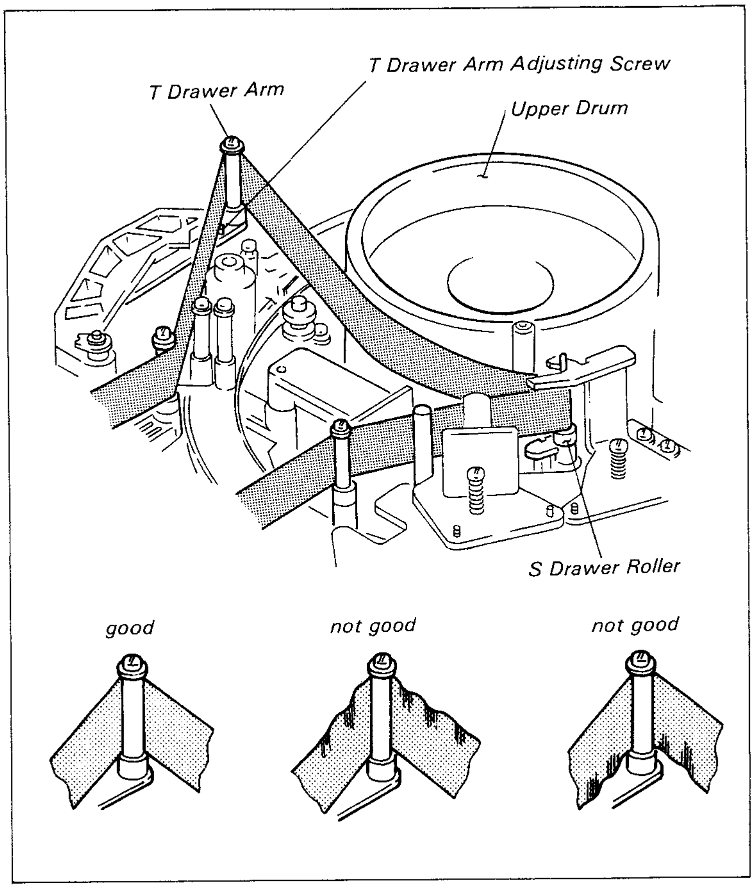
(3) Check that the tape runs without any curl at the upper or lower flange of S Drawer Roller in the REW mode. (Spec. 2)

(4) Put the unit first into the STOP mode, and then into the REW mode. Check that the tape runs without any curl at the S Drawer Roller at the moment just after entering the REW mode. (Spec. 3)

(5) Put the unit into the FF mode. Check that the tape runs without any curl at the S Drawer Roller and T Drawer Arm at the moment of just after entering the FF mode. (Spec. 4)

Adjustment procedure:

(1) Adjust the slantness of the T Drawer Arm by turning the T Drawer Arm Adjusting Screw.



7-2. T CORRECTION GUIDE SLANTNESS ADJUSTMENT

Check procedure:

(1) Insert a KCA-60 cassette tape, and put the unit into the FR-STOP mode.

(2) Press the PLAY button. The threading operation starts. Turn the power OFF when the Pinch roller is in front of the T Correction Guide.

(3) Check that the clearance between the top edge of the tape and the upper bracket of T Correction Guide meets the required specification.

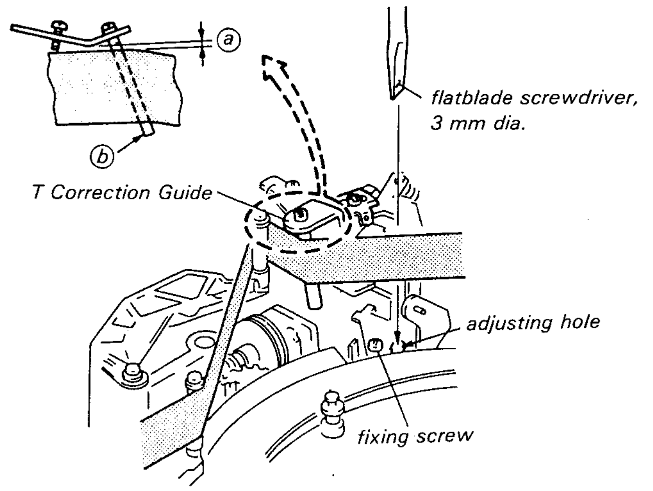
Adjustment procedure:

(1) Adjust the position of the T Correction Guide with flatblade screwdriver (3 mm dia.) until it meets the required specification.

(2) After adjustment, perform the Section 7-3, FWD Mode Tape Path Adjustment (1).

Spec.:

- *0.1 mm ≦ ⓐ ≦ 1.5 mm*
- *T Correction Guide is visible from the bottom edge of tape at ⓑ.*


ⓐ
ⓑ
T Correction Guide
flatblade screwdriver,
3 mm dia.
adjusting hole
fixing screw

7-3. FWD MODE TAPE PATH ADJUSTMENT (1)

- It is required that the Section 7-2, T Correction Guide Alantness Adjustment and Section 7-1, FF/REW Modes Tape Path Adjustment are correct before initiating this adjustment.

Mode: FWD mode

Check procedure:

(1) Insert a KCA-60 cassette tape (after the KCA-60 tape has run for 30 minutes). Put the unit into the FWD mode.

(2) Check that the tape runs without any curl at the upper or lower flange of the T Drawer Arm. (Spec. 1)

(3) Check that the tape tension is exactly equal at the top and bottom of the tape, and that the tape runs without any curl at the lower flange of the T Drawer Arm. (Spec.2)

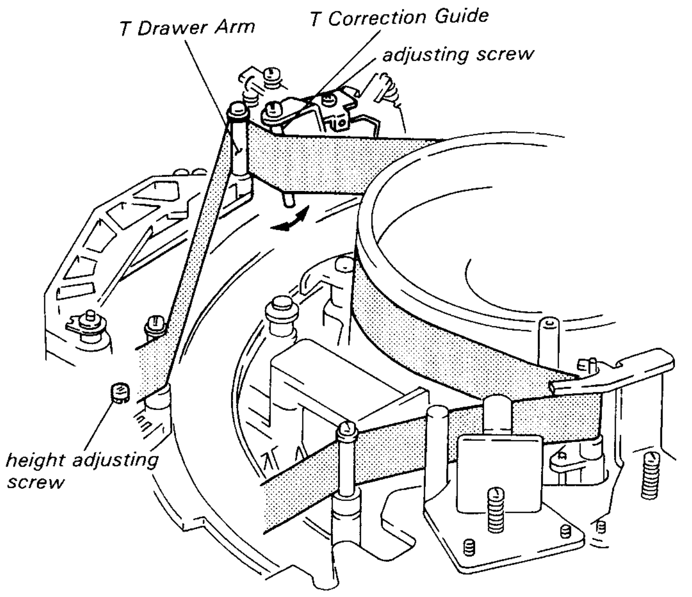
Adjustment procedure:

For Spec.1

(1) Adjust the height of the T Drawer Arm by turning the T Drawer Arm Height Adjusting Screws.

For Spec.2

(2) Adjust the T Correction Guide in the direction of the arrow by adjusting the screw.



7-4. FWD MODE TAPE PATH ADJUSTMENT (2)

Mode: FWD mode

Check procedure:

(1) Insert a KCA-60 cassette tape (use the middle portion of the tape). Put the unit into the FWD mode.

(2) Check carefully for the two positions indicated by the ※ mark in the figure; check that the tape tension is exactly equal at the top of the tape and the bottom of the tape. (Spec.1)

(3) Check that the clearance between the lower flange of Threading Roller and the bottom edge of the tape meets the required specification (2).

Adjustment procedure:

(1) Loosen the fixing screw in the bottom of the Threading Roller shown in the figure.

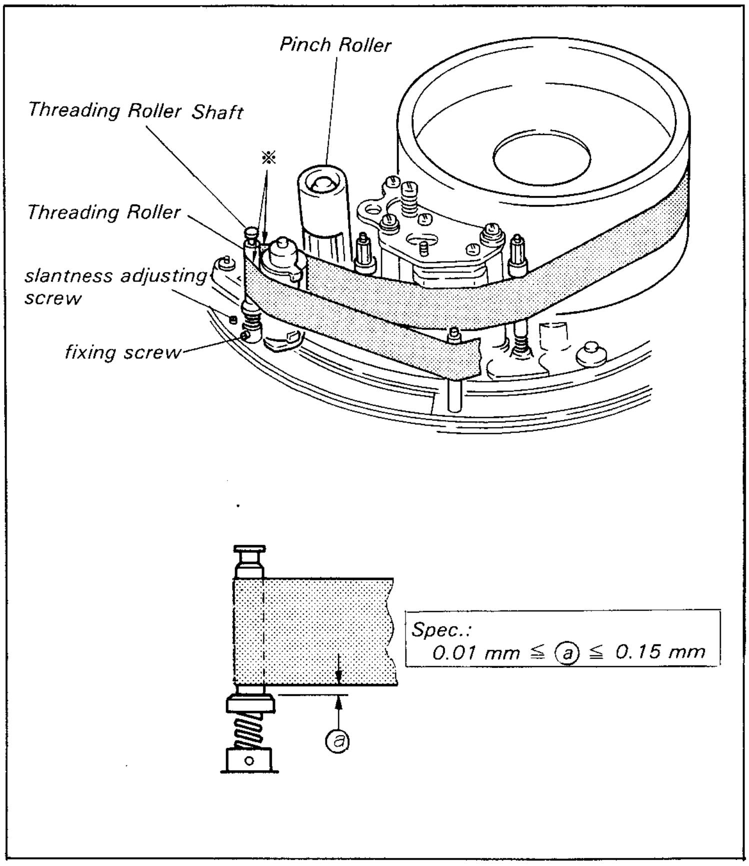
For Spec.1

(2) Adjust the slantness of the Threading Roller by turning the slantness adjusting screw.

For Spec.2

(3) Adjust the height of the Threading Roller by turning the Threading Roller Shaft.

(4) Check that the slantness and the height meet the required specifications (1) and (2) again.



Spec.:
0.01 mm ≦ ⓐ ≦ 0.15 mm

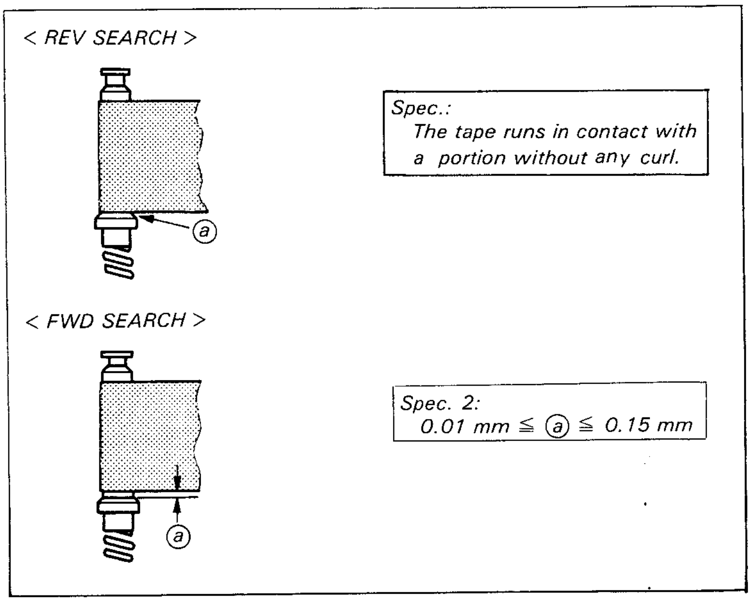
7-5. REV MODE TAPE PATH ADJUSTMENT

Check procedure:

(1) Insert a KCA-60 cassette tape (use the middle portion of the tape).

(2) Put the unit into the REV SEARCH mode. Check that the tape runs in contact with the lower flange of the Threading Roller without any curl.

(3) Put the unit into the FWD SEARCH mode. Check that the clearance between the lower flange of the Threading Roller and the bottom edge of the tape meets the required specification and the tape does not curl at the lower or upper flange of TG-4.



Spec.:
The tape runs in contact with a portion without any curl.

Spec. 2:
0.01 mm ≦ ⓐ ≦ 0.15 mm

Adjustment procedure:

(1) Fine adjust the height of the Threading Roller by turning the Threading Roller Shaft.

(2) After adjustment, perform the Section 7-4, FWD Mode Tape Path Adjustment (2).

7-6. TAPE PATH ADJUSTMENT AROUND PINCH ROLLER

Check procedure:

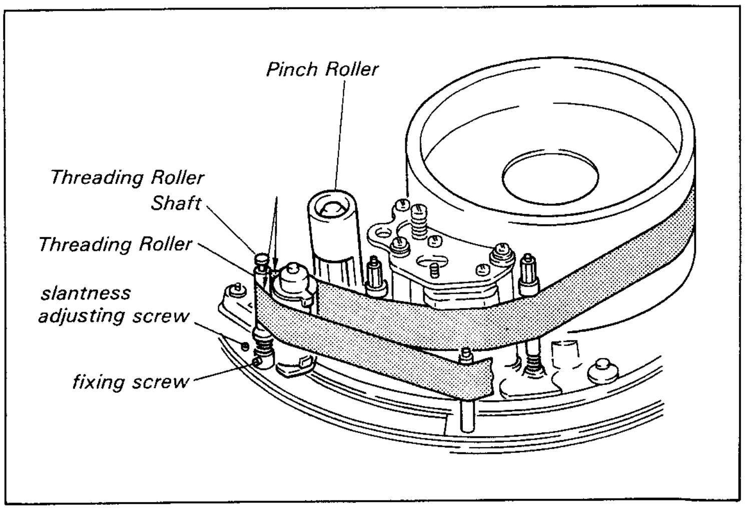
(1) Insert a KCA-60 cassette tape wound to the tape beginning portion.

(2) Put the unit into the PLAY, REV SEARCH, FWD SEARCH modes. Check that tape wrinkle does not appear, or disappear, within 2 sec. when the tape runs in the appropriate direction in these modes.

Adjustment procedure:

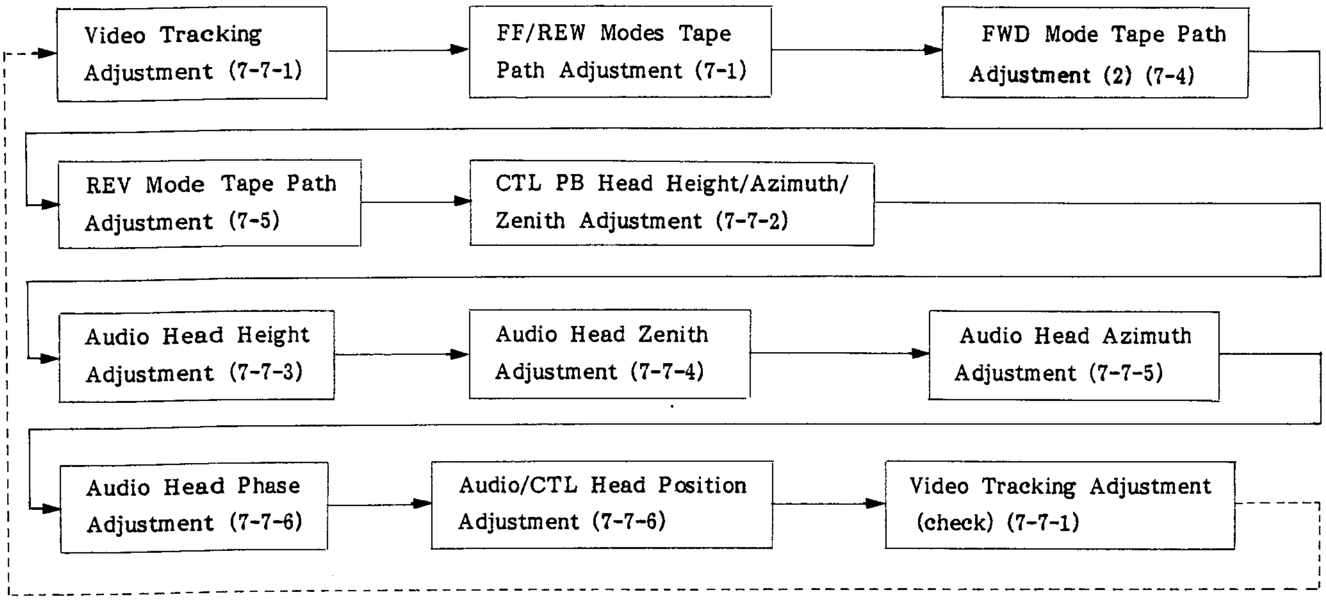
(1) Adjust the slantness and the height of the Threading Roller until it meets the required specification.

(2) After adjustment, perform Section 7-4, FWD Mode Tape Path Adjustment (2); Section 7-5, REV Mode Tape Run Adjustment; and Section 7-7, Tracking Adjustment.



7-7. TRACKING ADJUSTMENT

. The tracking adjustment is required to be performed in the following order.
(Numbers in the parenthesis refer to Section Nos.)


Video Tracking Adjustment (7-7-1)
FF/REW Modes Tape Path Adjustment (7-1)
FWD Mode Tape Path Adjustment (2) (7-4)
REV Mode Tape Path Adjustment (7-5)
CTL PB Head Height/Azimuth/ Zenith Adjustment (7-7-2)
Audio Head Height Adjustment (7-7-3)
Audio Head Zenith Adjustment (7-7-4)
Audio Head Azimuth Adjustment (7-7-5)
Audio Head Phase Adjustment (7-7-6)
Audio/CTL Head Position Adjustment (7-7-6)
Video Tracking Adjustment (check) (7-7-1)

7-7-1. Video Tracking Adjustment

Tool: Alignment tape, RR5-3SA
Flatness Plate
Oscilloscope

Preparation:

(1) Connect the oscilloscope to TP1 on the VA-35 Board and TP2 on the VA-35 Board.

(2) Playback the color-bar signal portion of the alignment tape.

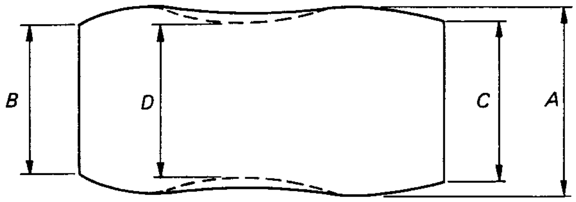
Check procedure:

(1) When turning the TRACKING control knob, check that the RF waveform maintains a flat envelope while the amplitude increases and decreases.

(2) Check that the RF envelope fluctuation and the head-to-tape contact are within the specification at the center detent position of the TRACKING control knob.

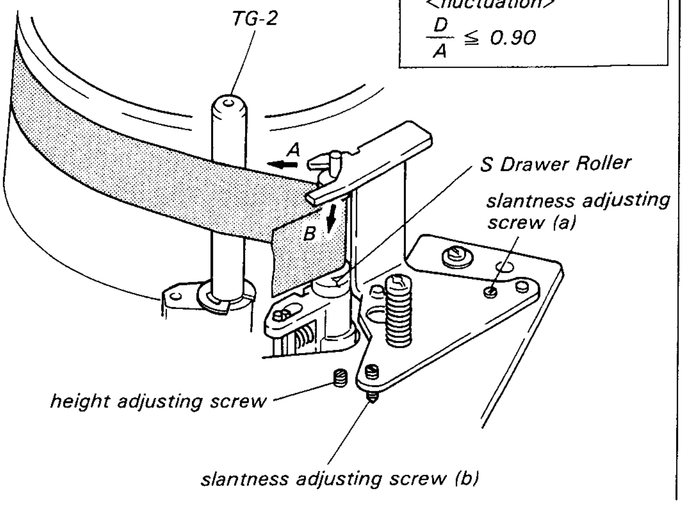
Adjustment procedure:

. The S Drawer Roller Block has three adjusting screws. These three adjusting screws function as follows:



Spec.:
<head to tape contact>
$\frac{B}{A} \leqq 0.70$ $\frac{C}{B} \leqq 0.70$

<fluctuation>
$\frac{D}{A} \leqq 0.90$


TG-2
A
B
S Drawer Roller
slantness adjusting screw (a)
height adjusting screw
slantness adjusting screw (b)

(i) Slantness Adjusting Screw (a)

Turn this screw in the clockwise direction, and the upper portion of the S Drawer Roller slants in the direction of arrow "A".

(ii) Slantness Adjusting Screw (b)

Turn this screw in the counterclockwise direction, and the upper portion of the S Drawer Roller slants in the direction of arrow "B".

(iii) Heigh Adjusting Screw

Turn this screw in the clockwise direction, and the height of the S Drawer Roller lowers.

- When the drum exit side tape guides (TG-3, TG-4) adjustment are performed, loosen the locking screw about 1 turn and adjust the height by turning the height adjusting nut.

- When the tracking at the drums entrance side is not good.

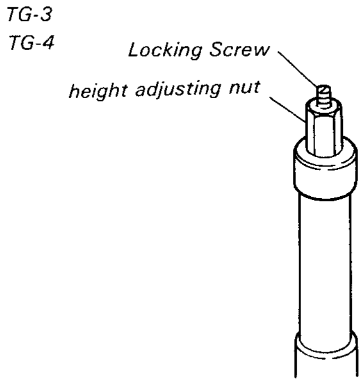
(1) Turn the TRACKING control knob so that the RF envelope amplitude is 70 to 80 % of the maximum amplitude.

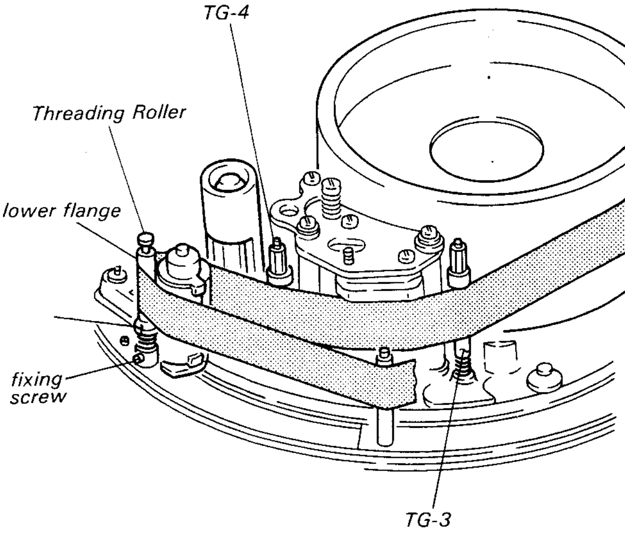
(2) Adjust the height and the slantness of the S Drawer Roller by turning the height adjusting screw and the slantness adjusting screw (a) so that RF envelope of the entrance side is flat.

NOTE:

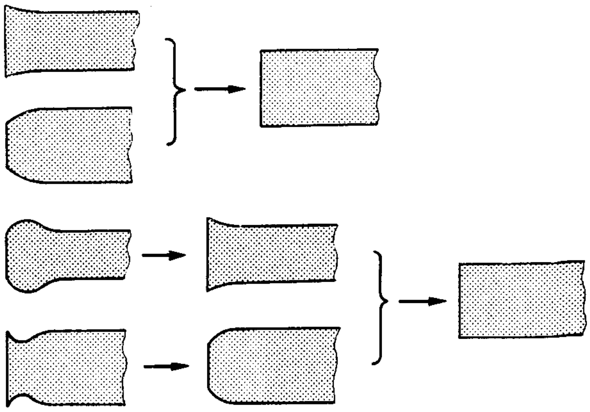
(i) Observe the surface of the running tape very carefully around the S Drawer Roller. Check that the tape tension is exactly equal at the top of the tape and the bottom of the tape.

(ii) Check that the tape runs in contact with the upper flange of the S Drawer Roller without any tape curl.





< drum entrance side >



- When the tracking at the drum's center portion is not good, it is necessary that the drum's input side tracking adjustment to be correctly adjusted before initiating this adjustment.

(3) Turn the TRACKING control knob so that the RF envelope amplitude is 70 to 80% of the maximum amplitude.

(4) Adjust the height and the slantness of the S Drawer Roller by turning the height adjusting screw and the slantness adjusting screw (a) so that the RF envelope at the drum center portion is flat.

NOTE:

(i) Adjust the slantness adjusting screw (a) in the clockwise direction within 10 degrees.

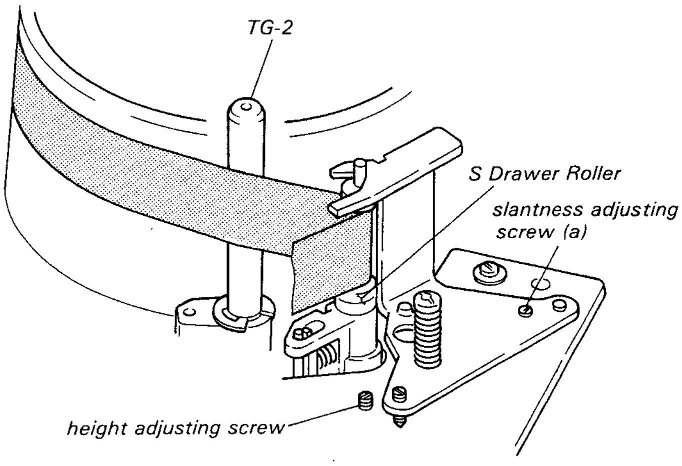
(ii) When the drum's center portion tracking adjustment is performed, the drum entrance side tracking must remain flat.

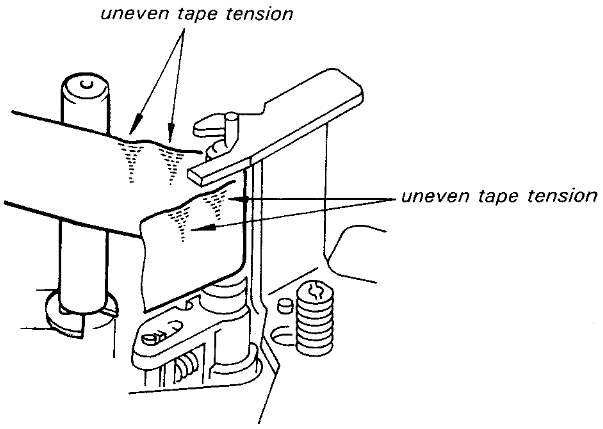
(iii) Check that the tape runs in contact with the upper flange of the S Drawer Roller without any tape curl.

(5) When the RF envelope is not flat in Step (4), adjust the height of TG-3 and TG-4.

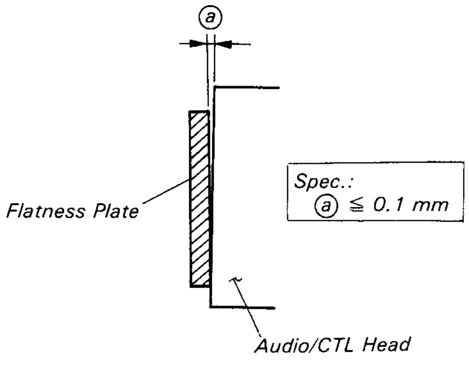
(6) When the RF envelope is not flat in Steps (4) and (5), adjust the zenith of the Audio/CTL Head within the allowable range. Adjust the height of TG-3 and TG-4 again.

(7) Check that the clearance between the bottom edge of the tape and the lower flange of the Threading Roller is 0.01 mm to 0.15 mm. If it does not, perform the height adjustment of the Threading Roller by turning the Threading Roller Shaft.


TG-2
S Drawer Roller
slantness adjusting screw (a)
height adjusting screw


uneven tape tension
uneven tape tension

< zenith adjusting for audio/CTL head >

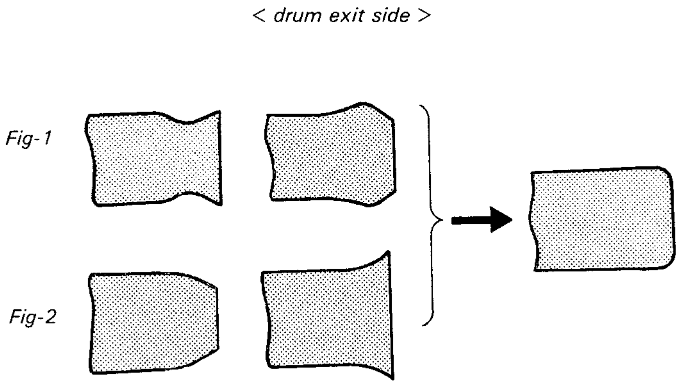

ⓐ
Flatness Plate
Spec.:
ⓐ ≦ 0.1 mm
Audio/CTL Head

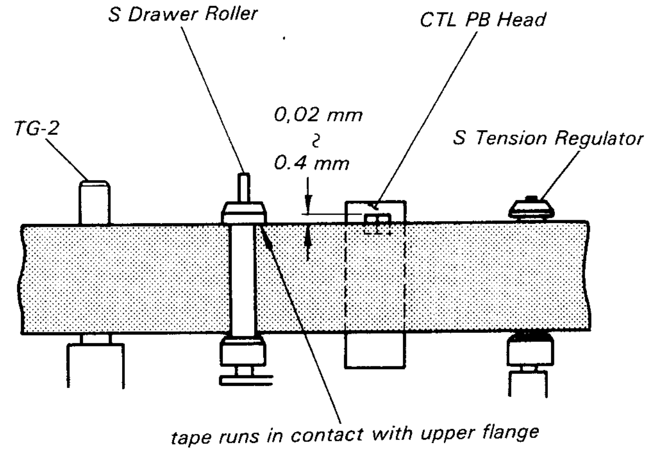
- When the tracking at the drum's exit side is not good.

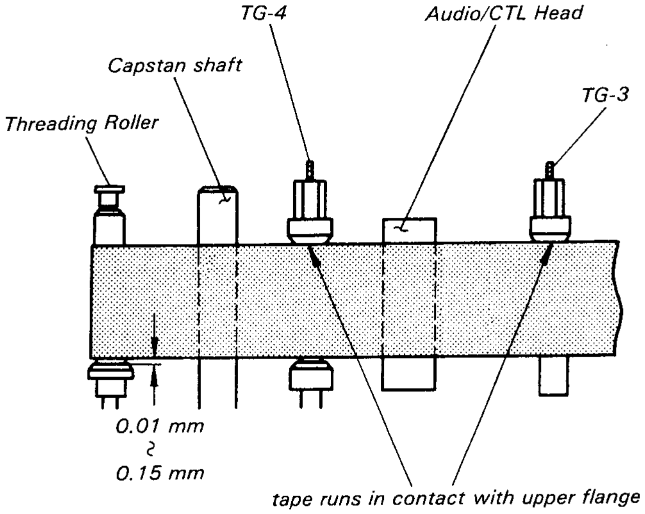
(8) Turn the TRACKING control knob so that the RF envelope amplitude is 70 to 80% of the maximum amplitude.

(9) When the RF envelope is not flat as shown in the figure 1, adjust the height of TG-4 so that the RF envelope is flat. After this adjustment, adjust the height of TG-3 so that the tape runs in contact with the upper flange. When the RF envelope is not flat as shown in the figure 2, adjust the height of TG-3 and TG-4 so that the RF envelope is flat. If it does not, adjust the zenith of the Audio/CTL Head within the allowable range. Adjust the height of TG-3 and TG-4 again.

(10) Check that the clearance between the bottom edge of the tape and the lower flange of Threading Roller is 0.01 mm to 0.15 mm. If it does not, perform the height adjustment of Threading Roller by turning the Threading Roller Shaft.


< drum exit side >
Fig-1
Fig-2


S Drawer Roller
CTL PB Head
TG-2
0,02 mm
~
0.4 mm
S Tension Regulator
tape runs in contact with upper flange


TG-4
Audio/CTL Head
Capstan shaft
TG-3
Threading Roller
0.01 mm
~
0.15 mm
tape runs in contact with upper flange

7-7-2. CTL PB Head Height/Azimuth/Zenith Adjustments

- The CTL PB Head Height, Azimuth, and Zenith Adjustments are closely related. If any one of these three adjustments is attempted, perform the other two adjustments at the same time.

Tool: Flatness plate

Check procedure:

(1) Check that the top and bottom clearances between the CTL PB Head and the TG-1 meets the required specification.
(Spec. 2 : azimuth check)

(2) Check that the clearance between the CTL PB Head and the Flatness Plate meets the required specification, when the flatness plate is placed on the CTL PB Head and TG-1. (Spec. 3 : zenith check)

(3) Insert a cassette tape, and put the unit into the FWD mode.

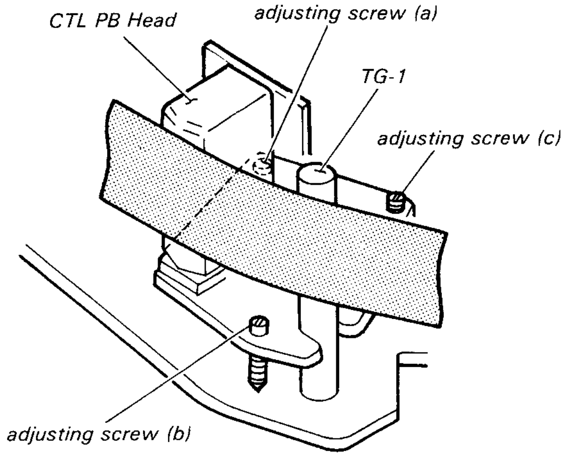
(4) Check that the relationship between the top edge of tape and the CTL PB Head meets the required specification.
(Spec. 1 : height check)

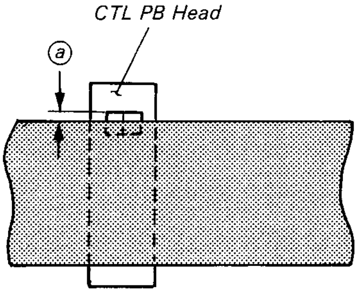
Adjustment procedure:

(1) Adjust adjusting screw (a) to meet the required specification (2).

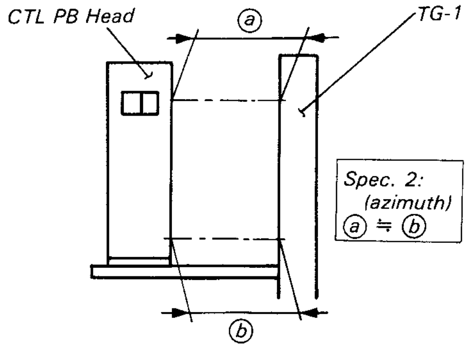
(2) Adjust adjusting screw (b) to meet the required specification (3).

(3) Turn the three adjusting screws an equal amount in the clockwise or counter-clockwise direction so that the relationship between the tape and the head meets the required specification (1).

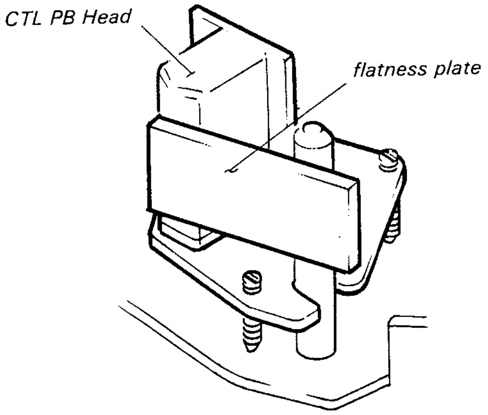


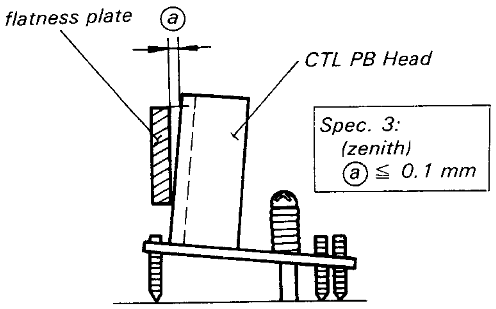


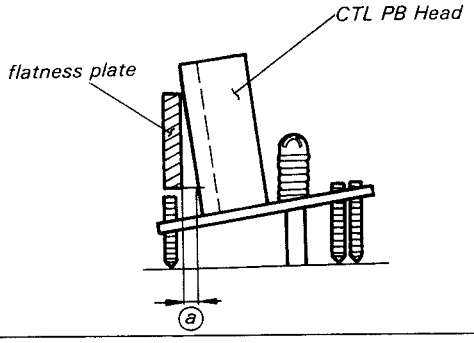
Spec. 1:
(height)
0.02 mm ≦ ⓐ ≦ 0.4 mm



Spec. 2:
(azimuth)
ⓐ ≒ ⓑ


CTL PB Head
flatness plate


flatness plate
ⓐ
CTL PB Head
Spec. 3:
(zenith)
ⓐ ≦ 0.1 mm


CTL PB Head
flatness plate
ⓐ

7-7-3. Audio Head Height Adjustment

Tool: Alignment tape, RR5-3SA
VTVM or oscilloscope

Preparation:

(1) Connect the VTVM or oscilloscope to the AUDIO OUT CH-1 and CH-2 terminals.

(2) Playback the audio 1 kHz signal portion of the alignment tape.

Check procedure:

(1) Check that the CH-1 output level increase is less than 0.5 dB when pressing down at "A". If it is not met, perform adjustment procedures (1) and (2).

(2) Check that the CH-2 output level increase is less than 0.5 dB when pushing up at "B". If it is not met, perform adjustment procedures (3) and (4).

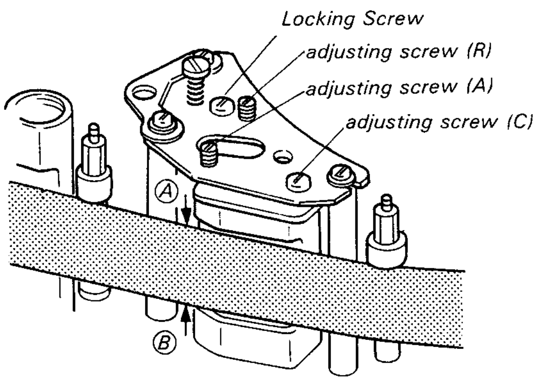
Adjustment procedure:

(1) Loosen the locking screw and turn adjusting screws (R) and (A) an equal amount in the counterclockwise direction and turn adjusting screw (C) the same amount in the clockwise direction.

(2) Tighten the locking screw and check the height again.

(3) Loosen the Locking Screw and turn adjusting screws (R) and (A) of an equal amount in the clockwise direction and turn adjusting screw (C) the same amount in the counterclockwise direction.

(4) Tighten the locking screw and check the height again.



Spec.:

- *CH-1 level increase is less than 0.5 dB when pressing down at Ⓐ.*
- *CH-2 level increase is less than 0.5 dB when pushing up at Ⓑ.*

7-7-4. Audio Head Zenith Adjustment

Tool: Flatness Plate

Check procedure:

(1) When the Flatness Plate is set on the Audio Head and TG-3, check that the clearance between the Audio Head and the Flatness Plate meets the required specification.

Adjustment procedure:

- When the clearance is out of spec. at the top portion of the Audio Head.

(1) Turn adjusting screw (R) in the counterclockwise direction.

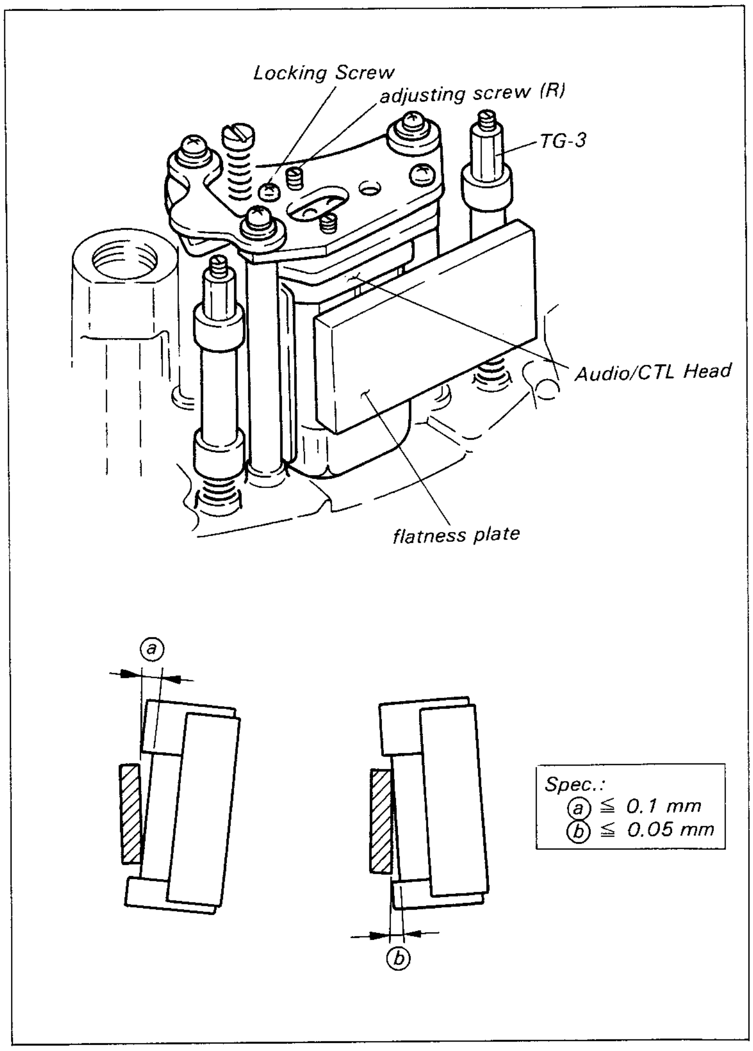
(2) Tighten the locking screw and check the zenith again.

- When the clearance is out of spec. at the bottom portion of the Audio Head.

(3) Loosen the locking screw 1/4 to 1/2 turn.

(4) Turn adjusting screw (R) in the clockwise direction.

(5) Tighten the locking screw and check the zenith again.



7-7-5. Audio Head Azimuth Adjustment

Tool: Alignment tape, RR5-3SA
VTVM or oscilloscope

Preparation:

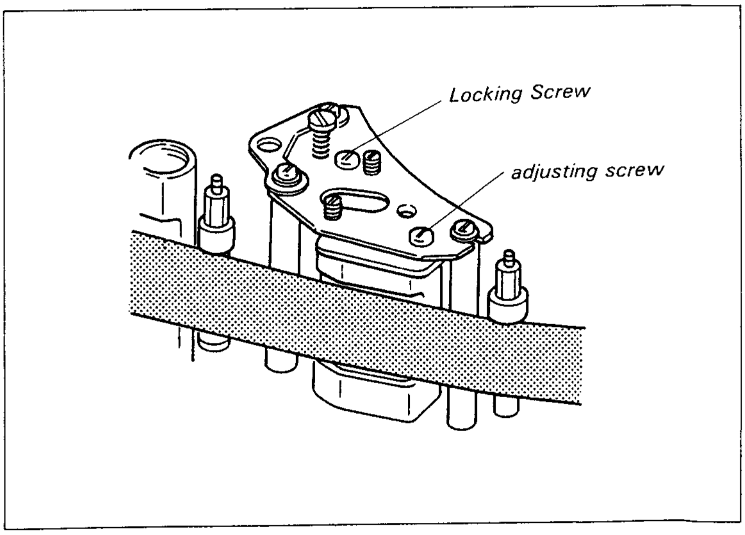
(1) Connect the VTVM or oscilloscope to the AUDIO OUT CH-1 or CH-2 terminal.

(2) Playback the audio 10 kHz signal portion of the alignment tape.

Adjustment procedure:

(1) Loosen the locking screw and adjust for the maximum output level by turning the adjusting screw.

(2) Tighten the locking screw.



7-7-6. Audio Head Phase Adjustment

Tool: Alignment tape, RR5-3SA
Oscilloscope

Preparation:

(1) Connect the horizontal and vertical terminals of the oscilloscope to the AUDIO OUT CH-1 and CH-2 terminals.

(2) Playback the audio 1 kHz signal portion of the alignment tape.

(3) Adjust the scope for a lissajous waveform with horizontal and vertical amplitudes of 6 cm.

Check procedure:

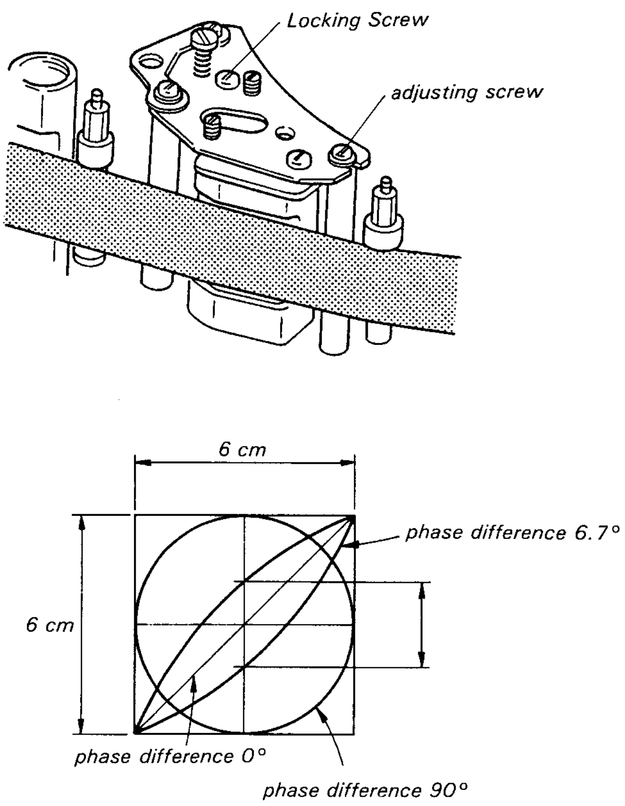
(1) Playback the audio 1 kHz signal portion of the alignment tape, and check that the vertical amplitude at the center in the horizontal direction meets the required specification.

(2) Playback the audio 10 kHz signal portion of the alignment tape, and check that the lissajous waveform meets the required specification.

Adjustment procedure:

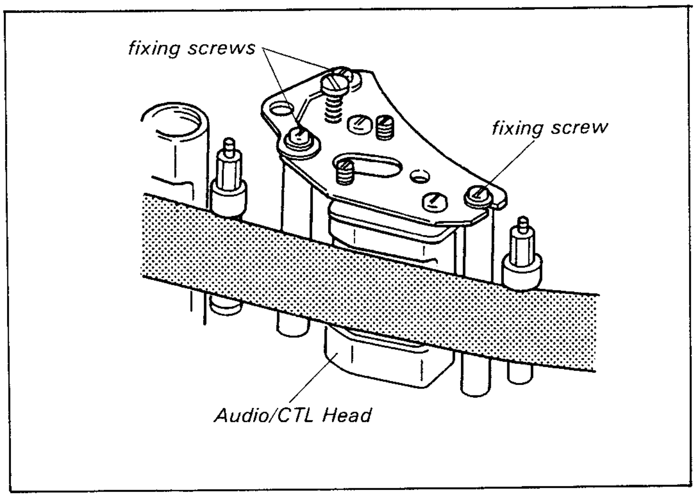
(1) Loosen the locking screw 1/4 to 1/2 turn and adjust the phase by turning the adjusting screw.

(2) Tighten the locking screw and confirm the phase again.



Spec.:
- *within 0.7 cm at 1 KHz (within 6.7°)*
- *within 90° at 10 KHz*

7-7-7. Audio/CTL Head Position Adjustment



Tool: Alignment tape, RR5-3SA
Oscilloscope

Preparation:

(1) Connect the oscilloscope to TP1 on the VA-35 Board and the EXT.TRIG to TP1 on the VA-35 Board.

(2) Playback the color-bar signal portion of the alignment tape.

Check procedure:

(1) While turning the TRACKING control knob, check that the RF envelope has the maximum amplitude at the center detent position.

Adjustment procedure:

(1) Adjust the position of the Audio/CTL Head.

7-8. VIDEO HEAD DIHEDRAL ADJUSTMENT

Tool: Dihedral adjustment screwdriver
Alignment tape, RR5-3SA
monitor TV

Check procedure:

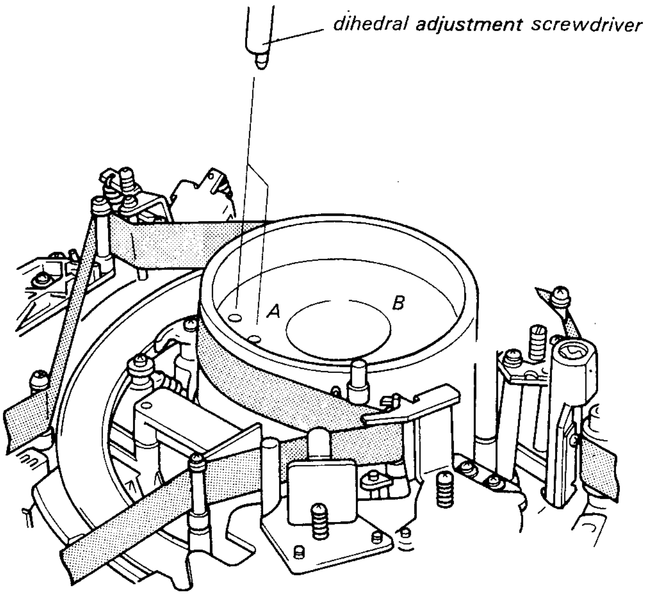
(1) Playback the monoscope signal of the alignment tape.

(2) Check the clearance of the vertical line beneath the switching point on the monitor screen. If the clearance of the separate lines is more than the width of a vertical line, adjustment is necessary.

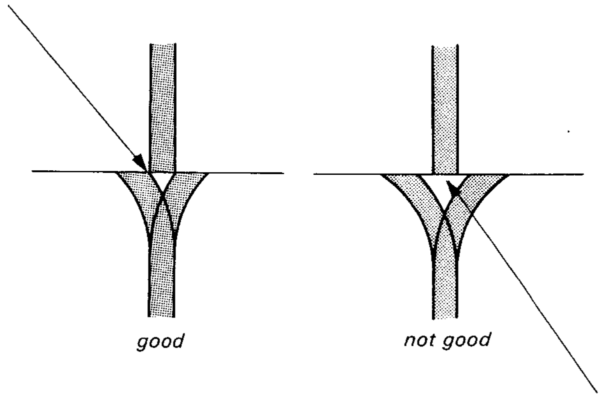
Adjustment procedure:

(1) Insert the adjustment screwdriver into the adjusting hole on the side of the Video Head marked with "A", and adjust the dihedral screw.

(2) Playback the monoscope signal. When the distortion has become worse, insert the adjustment screwdriver in the other adjusting hole (on the opposite side of the Video Head), and adjust the dihedral screw.



If the clearance of the separate lines is within the width of a vertical line, adjustment is not necessary.



If the clearance of the separate lines is more than the width of a vertical line, adjustment is necessary.

SECTION 8
POWER SUPPLY/SYSTEM CONTROL ALIGNMENT

[Equipment Required]
- DC Voltmeter
- Alignment tape: RR5-3SA (Part No. 8-960-015-04)

8-1. SWITCHING REGULATOR ADJUSTMENT

8-1-1. REG +12V Adjustment

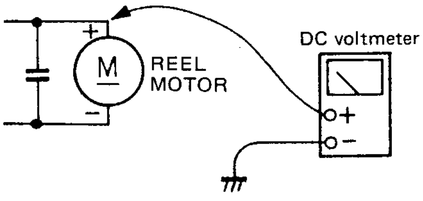
machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape.	CN201-1/UR-14 12.1 ± 0.02 Vdc	⊘ RV651/UR-14

NOTE: If the REG 12V adjustment is attempted, re-alignment of the video system and servo system is required.
Do not attempt adjustment to the REG 12V power supply unless machine performance is obviously poor due to incorrect power supply voltage. If adjustments are made to the power supply, re-alignment of the video and servo systems is necessary.

8-2. TAPE SENSOR BALANCE ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
● Set the cassette tape. ● STOP mode.	TP2/SY-51 (J-2) 6.0 ± 0.2 Vdc	⊘RV1/SY-51 (J-2)

8-3. REEL MOTOR STILL ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
● PLAY-PAUSE mode without inserting a cassette tape. ● Check that reel motor rotation stops.	Reel motor (+) side/RM-39  + M REEL MOTOR − DC voltmeter + − Chassis DC voltage = 400 ±20 mV	⊘RV4/SY-51 (H-2)

- For reel torque adjustment, refer to Section 6.
  RV3/SY-51 . . . . 6-3. FWD Torque Adjustment
  RV2/SY-51 . . . . 6-4. REV Torque Adjustment

SECTION 9
SERVO SYSTEM ALIGNMENT

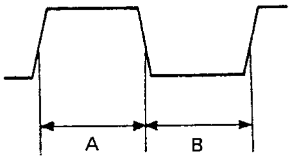
[Equipment Required]
- Dual-trace oscilloscope
- Frequency counter
- Vacuum tube voltmeter (VTVM)
- Alignment tape: RR5-3SA (Part No. 8-960-015-04)

Real Time Counter (min.)	Tape Counter	Video Track	Audio Track
00:00 – 04:00	000 – 100	Monoscope	3 kHz, 0 dB
04:00 – 09:00	100 – 208	Color-bar	————
09:00 – 14:00	208 – 300	R-F sweep	————
14:00 – 16:00	300 – 335	Mod. 20T pulse	1 kHz, 0 dB
16:00 – 18:00	335 – 367	M.S. w/burst	10 kHz, –10 dB
18:00 – 20:00	367 – 398	Pseudo C.B. for DOC adj.	————

9-1. CTL HEAD POSITION ADJUSTMENT

Refer to Section 7-7.

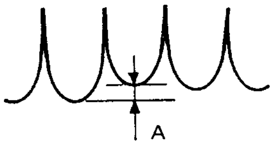
9-2. CAPSTAN FREE SPEED ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of the alignment tape.	TP3/SV-74 (G-4)  A = B ± 5% (Take reading at the center of jitter.)	⊘ RV100/SV-74 (G-4) TRIG: INT

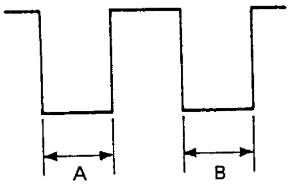
9-3. CAPSTAN SEARCH SPEED ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• Short between TP3 and E1/SY-51 with a shorting clip. • Short between TP28 and E1/SV-74 with a shorting clip. • Play back the color bar segment of the alignment tape. • SEARCH mode. • After adjustment is completed, remove the shorting clips.	TP27/SV-74 (G-4) Frequency counter 180 ± 40 Hz	⊘ RV101/SV-74 (H-5)

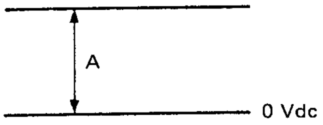
9-4. CAPSTAN STOP SERVO ADJUSTMENT (1)

machine conditions for adjustment	**spec.**	**adjustment**
• Short between TP16 and TP19/SV-74 with a shorting clip. • Play back the color bar segment of the alignment tape. • After adjustment is completed, remove the shorting clip.	TP21/SV-74 (H-6)  A < 40 mV	⊘ RV106/SV-74 (I-5) TRIG: INT

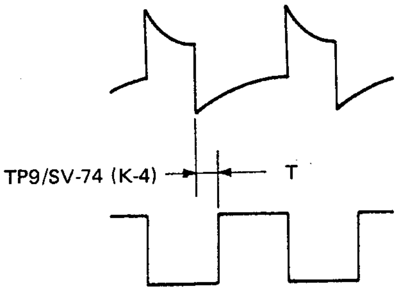
9-5. CAPSTAN FWD/REV DETECTION ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape.	TP25/SV-74 (G-6)  A = B	⊘ RV201/SV-74 (I-5) TRIG: INT

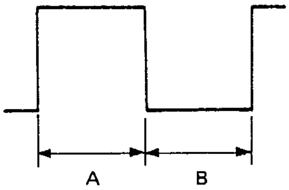
9-6. CAPSTAN STOP SERVO ADJUSTMENT (2)

machine conditions for adjustment	spec.	adjustment
• Short between TP6 and TP22/SV-74 with a shorting clip. • Play back the color bar segment of the alignment tape and set to the PAUSE mode. • After adjustment is completed, remove the shorting clip.	TP26/SV-74 (E-3)  A = 1.0 ± 0.1 V	⊘ RV107/SV-74 (H-4) TRIG: INT

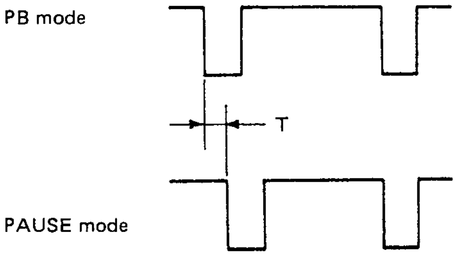
9-7. TRACKING MULTI ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Set the TRACKING control to the center click position. • Play back the color bar segment of the alignment tape.	TP4/SV-74 (K-4)  T = 0 ± 100 μsec (Take reading at the center of jitter.)	⊘ RV407/SV-74 (H-2) TRIG: INT (TP9/SV-74)

9-8. DRUM FREE SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape.	TP15/SV-74 (E-2)  A = B ± 5%	⊘RV401/SV-74 (M-3) TRIG: INT

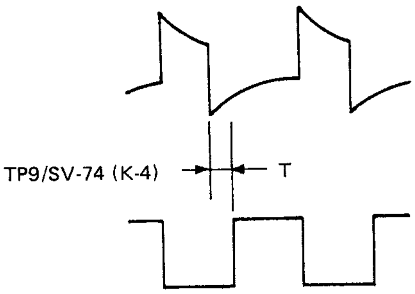
9-9. DRUM AFC LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape. • PB and PAUSE modes.	TP8/SV-74 (K-2)  T = 0 ± 0.1 μsec	⊘RV3/SV-74 (G-2) TRIG: INT

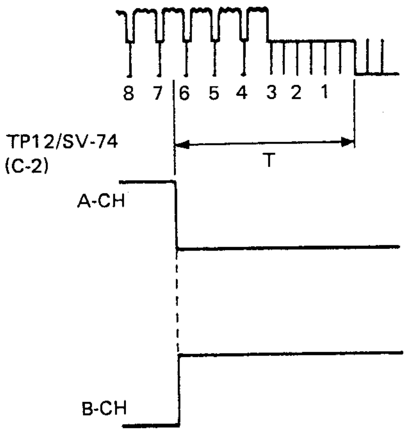
9-10. DRUM AFC TRANSIENT ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape. • PB and PAUSE modes.	TP17/SV-74 (D-2) DC level in the PAUSE mode = Reference DC level in the PB mode = Reference ±0.1 Vdc.	⊘RV1/SV-74 (F-2)

9-11. INSTANT START ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Set the TRACKING control to the center click position. • Play back the color bar segment of an alignment tape and set to the PAUSE mode. • Short between TP11 and E1/SV-74 with a shorting clip. • Cancel the PAUSE mode. • After adjustment is completed, remove the shorting clip.	TP4/SV-74 (K-4)  T = 0 ± 1 msec (Take reading at the center of jitter.)	⊘ RV102/SV-74 (H-3) TRIG: ING (TP9/SV-74)

9-12. SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape. • Short between TP8 and E501/SV-74 with a shorting clip. • Short between TP5 and E501/SV-74 with a shorting clip. • Set the TRACKING control to the center click position. • After adjustment is completed, remove the shorting clips.	VIDEO OUT connector  T = 6.5 ± 0.5H	A-CH adj. ⊘ RV405/SV-74 (I-2) B-CH adj. ⊘ RV403/SV-74 (L-3) TRIG: TP9/SV-74 (TV-V)

SECTION 10
AUDIO SYSTEM ALIGNMENT

[Equipment Required]
- Vacuum tube voltmeter (VTVM)
- Alignment tape: RR5-3SA (Part No. 8-960-015-04)

Real Time Counter (min.)	Tape Counter	Video Track	Audio Track
00:00 – 04:00	000 – 100	Monoscope	3 kHz, 0 dB
04:00 – 09:00	100 – 208	Color-bar	———
09:00 – 14:00	208 – 300	R-F sweep	———
14:00 – 16:00	300 – 335	Mod. 20T pulse	1 kHz, 0 dB
16:00 – 18:00	335 – 367	M.S. w/burst	10 kHz, −10 dB
18:00 – 20:00	367 – 398	Pseudo C.B. for DOC adj.	———

10-1. AUDIO HEAD POSITION ADJUSTMENT

Refer to Section 7-7.

10-2. AUDIO PLAYBACK FREQUENCY RESPONSE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the 1 kHz and 10 kHz segments of the alignment tape.	LINE OUT connector (terminated by 47 kΩ) 1 kHz level = Reference level 10 kHz level = Reference level − 10 ±1 dB Adjust both CH-1 and CH-2.	CH-1 adj. ⊘ RV901/VA-35 (I-7) CH-2 adj. ⊘ RV902/VA-35 (H-7)

10-3. AUDIO PLAYBACK OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Play back the 1 kHz segment of the alignment tape.	LINE OUT connector (terminated by 47 kΩ) −5 ± 0.5 dBS Adjust both CH-1 and CH-2.	CH-1 adj. ⊘ RV903/VA-35 (I-7) CH-2 adj. ⊘ RV904/VA-35 (H-7)

SECTION 11

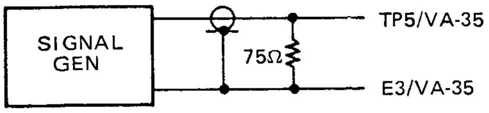
VIDEO SYSTEM ALIGNMENT

[Equipment Required]

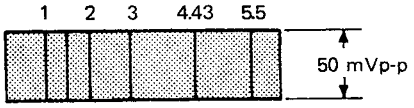
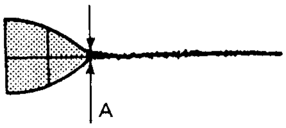
- Dual-trace oscilloscope
- Frequency counter
- Video sweep signal generator
- DC voltmeter
- Alignment tape: RR5-3SA (Part No. 8-960-015-04)

Real Time Counter (min.)	Tape Counter	Video Track	Audio Track
00:00 – 04:00	000 – 100	Monoscope	3 kHz, 0 dB
04:00 – 09:00	100 – 208	Color-bar	———
09:00 – 14:00	208 – 300	R-F sweep	———
14:00 – 16:00	300 – 335	Mod. 20T pulse	1 kHz, 0 dB
16:00 – 18:00	335 – 367	M.S. w/burst	10 kHz, –10 dB
18:00 – 20:00	367 – 398	Pseudo C.B. for DOC adj.	———

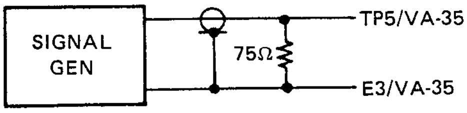
11-1. NOISE CANCELLER ADJUSTMENT



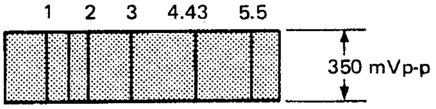
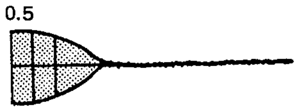
Locked sweep
Marker: 1/1.14/2/3/4.43/5.5 MHz

machine conditions for adjustment	**spec.**	**adjustment**
• Unsolder and open SLIT 1/VA-35. • Connect a signal generator to TP5 and E3/VA-35.	TP5/VA-35 (F-8) 	⊘ Level control/SIGNAL GEN.
⇩	⇩	
• Short between CN2-1 and E3/ VA-35 with a shorting clip. • Short between TP11 and E6/ VA-35 with a shorting clip. • VIDEO OUT connector: terminated by 75Ω. • After adjustment is completed, remove the shorting clips. Then solder and short SLIT 1/ VA-35.	TP6/VA-35 (B-10)  Minimize the level of A (2 MHz).	⊘ RV8/VA-35 (E-9) TRIG: TRIG OUT/SIGNAL GEN.

11-2. HIGH COMPONENT MIX ADJUSTMENT

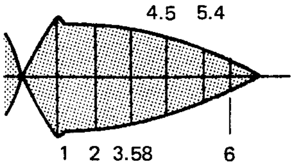


Locked sweep
Marker: 1/1.4/2/3/4.43/5.5 MHz

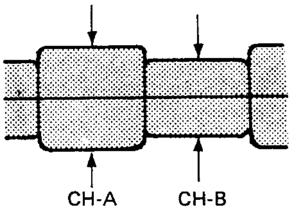
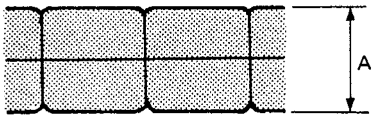
machine conditions for adjustment	spec.	adjustment
• Unsolder and open SLIT 1/VA-35. • Connect a signal generator to TP5 and E3/VA-35.	TP5/VA-35 (F-8) 	⊘ Level control/SIGNAL GEN.
• Short between CN2-1 and E3/VA-35 with a shorting clip. • Short between TP11 and E6/VA-35 with a shorting clip. • VIDEO OUT connector: terminated by 75Ω. • After adjustment is completed, remove the shorting clips. Then solder and short SLIT 1/VA-35.	TP6/VA-35 (B-10)  0.2 MHz level = Reference 0.5 MHz level = Reference $^{+5}_{-0}$%	⊘ RV7/VA-35 (E-10) TRIG: TRIG OUT/SIGNAL GEN.

11-3. PLAYBACK RF AMPLIFIER ADJUSTMENT

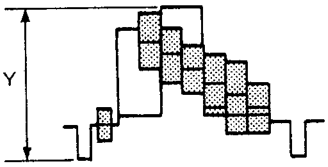
11-3-1. RF Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr><td>• Play back the RF sweep segment of the alignment tape.
• Short between TP8 and E3/SV-74 with a shorting clip.</td><td>TP1/VA-35 (E-3)
 </td><td>CH-A adj.
⊘ RV1/VA-35 (G-3)
CH-B adj.
⊘ RV2/VA-35 (G-2)</td></tr>
<tr><td>• After adjustment is completed, remove the shorting clip.</td><td><table><tr><th>2MHz</th><th>3.58MHz</th><th>4.5MHz</th><th>5.4MHz</th><th>6MHz</th></tr><tr><td>120
±20%</td><td>115
±15%</td><td>100%
reference</td><td>83
±10%</td><td>75
±15%</td></tr></table></td><td>TRIG: TP2/VA-35 (V)
CH-A ↑
CH-B ↓</td></tr>
</table>

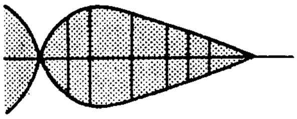
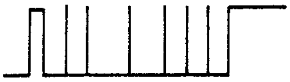
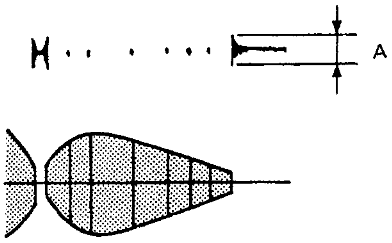
11-3-2. RF Balance/Level Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of an alignment tape. • Adjust the TRACKING control so that the RF level is maximized at TP1/VA-35.	TP1/VA-35 (E-3)  CH-A level = CH-B level ⇩	⊘ RV3/VA-35 (F-3) TRIG: TP2/VA-35 (V)
	TP1/VA-35 (E-3)  A = 200 ± 20 mV	⊘ RV4/VA-35 (F-3) TRIG: TP2/VA-35 (V)

11-4. Y OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of the alignment tape. • VIDEO OUT connector: terminated by 75Ω.	TP6/VA-35 (B-10)  Y level = 1.0 ± 0.05 V	⊘ RV6/VA-35 (E-6) TRIG: INT (TV-H)

11-5. DROPOUT COMPENSATION SENSITIVITY ADJUSTMENT

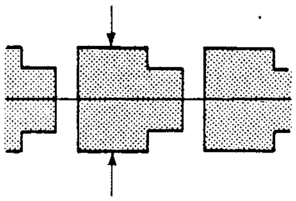
machine conditions for adjustment	**spec.**	**adjustment**
• Short between TP8 and E3/SV-74 with a shorting clip. • Play back the RF sweep segment of the alignment tape. • Set the TRACKING control to the center click position. • Oscilloscope: CHOP mode → ADD mode. • After adjustment is completed, remove the shorting clip.	TP1/VA-35 (E-3)  TP3/VA-35 (H-4)  ADD mode.  A = 20 mV	⊘ RV5/VA-35 (I-4) TRIG: TP2/VA-35 (V)

11-6. CHROMA DEMODULATOR ADJUSTMENT

11-6-1. Reference 3.58MHz Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
• Set the alignment tape. • STOP mode. • Three or more minutes should be elapsed after POWER ON.	TP15/VA-35 (C-7) 3,579,545 ± 5 Hz	⊘ CV1/VA-35 (A-8)

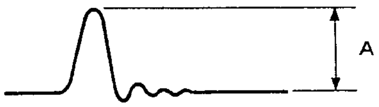
11-6-2. ACC Level Preset

machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of the alignment tape.	TP10/VA-35 (A-3)  0.6 ± 0.1 V	⊘ RV10/VA-35 (C-3) TRIG: TP2/VA-35 (V)

11-6-3. VCO DC Level Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of the alignment tape.	TP9/VA-35 (B-3) 8.1 ± 0.1 Vdc	⊘ RV9/VA-35 (B-5)

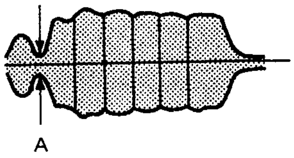
11-6-4. APC Gain Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape.	TP17/VA-35 (B-3)  A = 3.8 ± 0.1 V	⊘ RV13/VA-35 (B-2) TRIG: INT

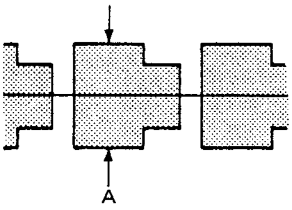
11-6-5. 4.27MHz Tuning Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape.	TP16/VA-35 (D-6) 4,267,959 ± 1000 Hz (Level ≧ 1.1 Vp-p)	⊘ LV2, LV3/VA-35

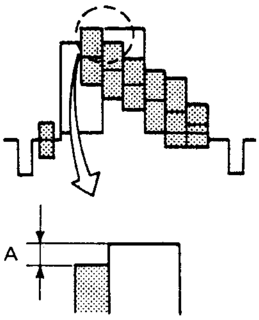
11-6-6. Converter Balance Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of the alignment tape.	TP10/VA-35 (A-3)  A (carrier leak) < 50 mV	⊘ RV11/VA-35 (D-4) TRIG: INT (H)

11-6-7. ACC Level Adjustment

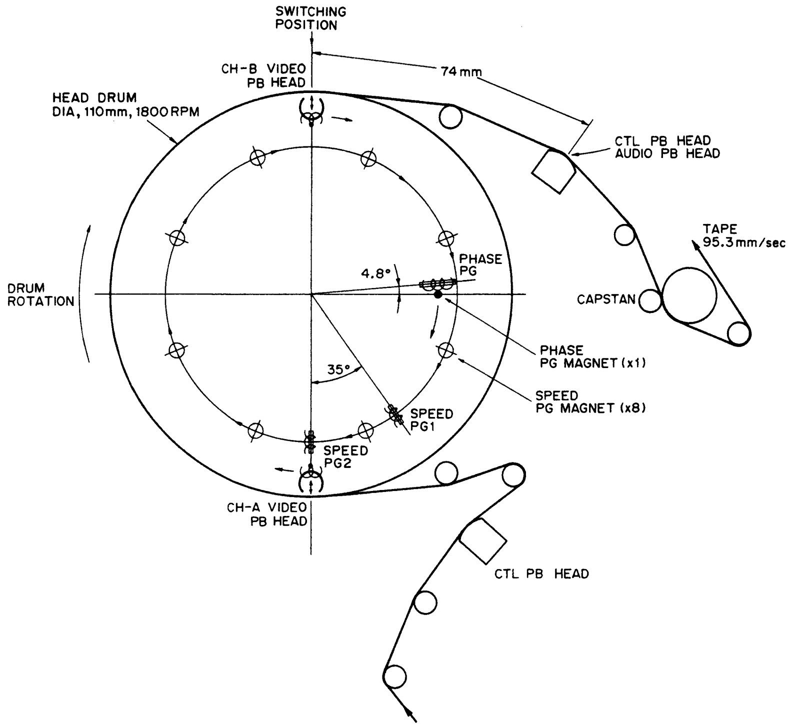
machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of the alignment tape.	TP10/VA-35 (A-3)  A = 0.6 ± 0.05 V	⊘RV10/VA-35 (C-3) TRIG: TP2/VA-35 (V)

11-6-8. Chroma Mix Level Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of the alignment tape.	TP6/VA-35 (B-10)  A = 0	⊘RV12/VA-35 (A-4) TRIG: INT (TV-H)

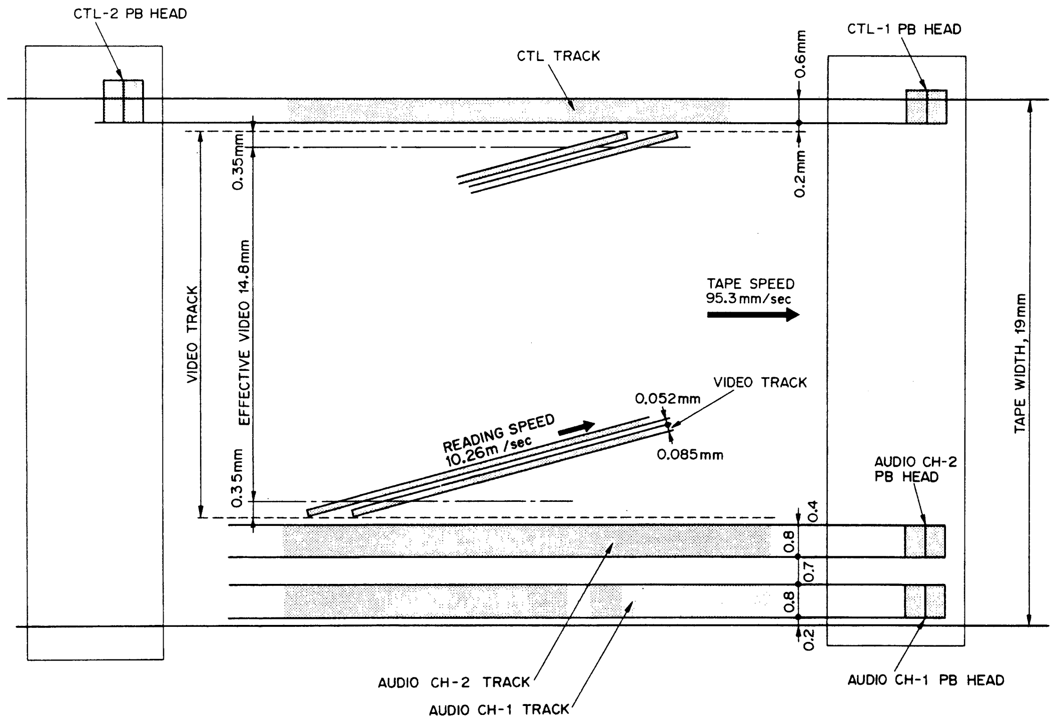
SECTION 12
BLOCK DIAGRAMS

HEAD LOCATION



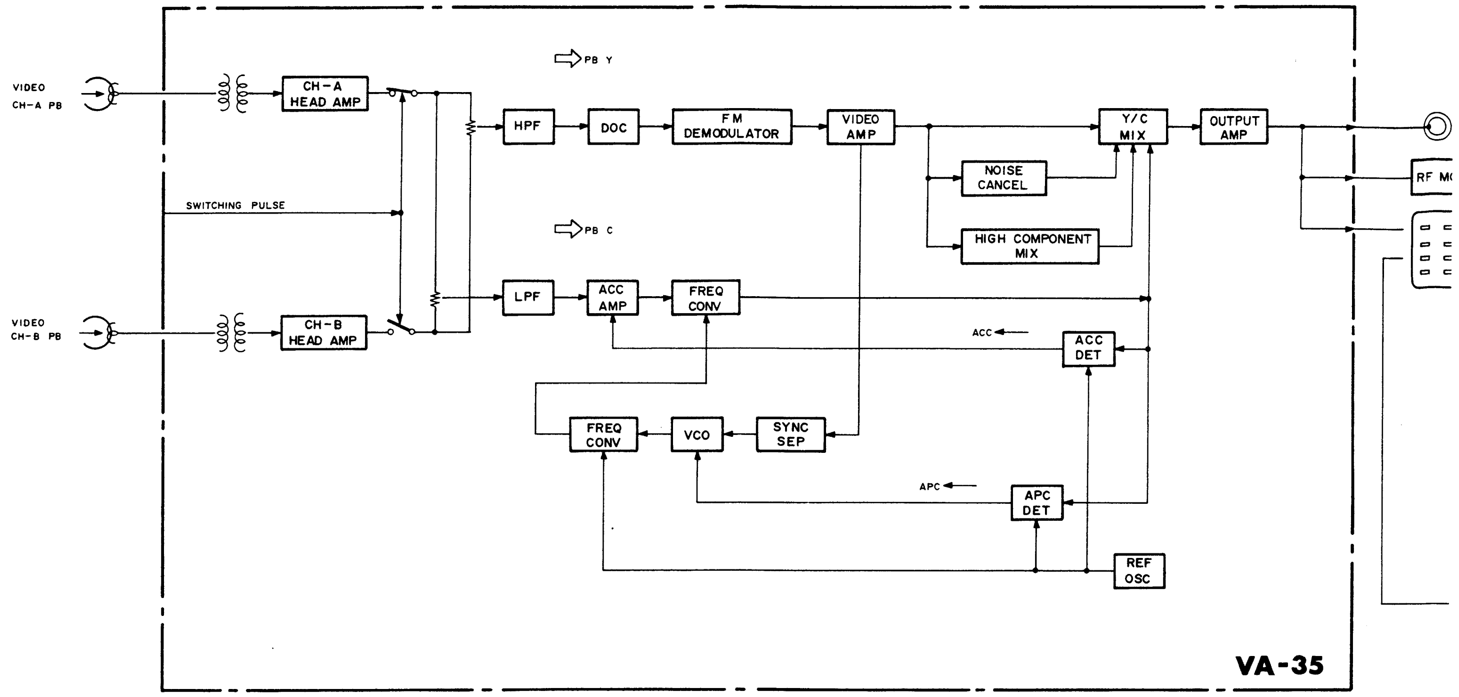
SWITCHING POSITION
CH-B VIDEO PB HEAD
74 mm
HEAD DRUM DIA, 110mm, 1800RPM
CTL PB HEAD AUDIO PB HEAD
TAPE 95.3mm/sec
PHASE PG
4.8°
DRUM ROTATION
CAPSTAN
PHASE PG MAGNET (x1)
35°
SPEED PG MAGNET (x8)
SPEED PG1
SPEED PG2
CH-A VIDEO PB HEAD
CTL PB HEAD

TAPE PATTERN

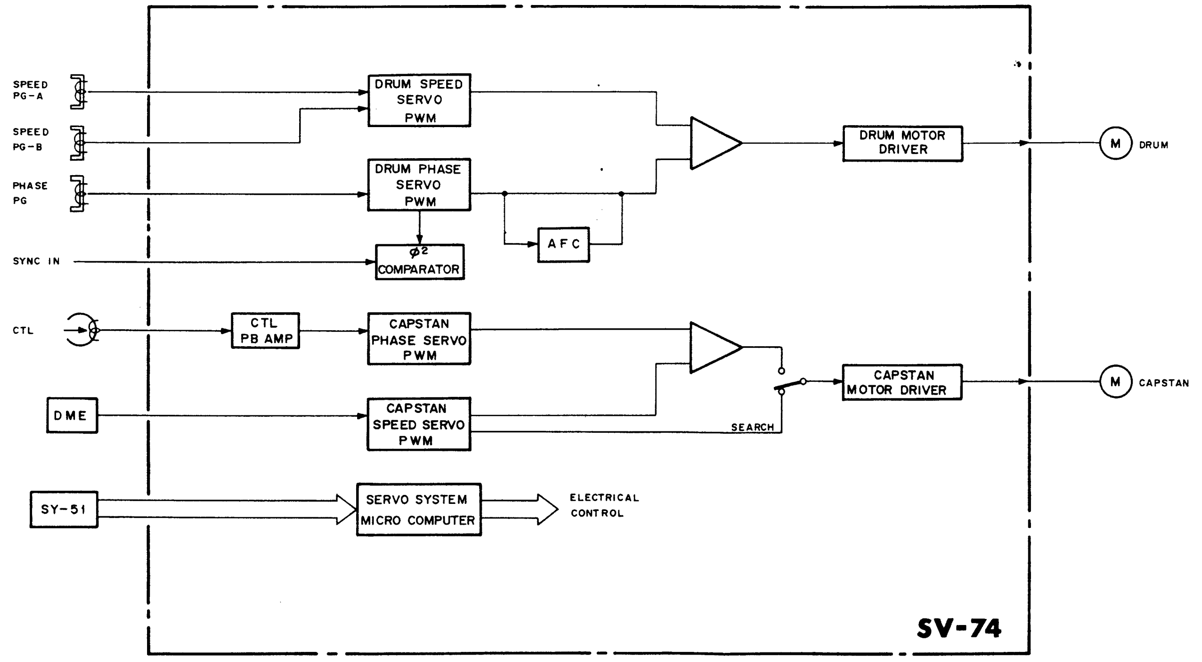


CTL-2 PB HEAD
CTL TRACK
0.6mm
CTL-1 PB HEAD
0.35mm
0.2mm
VIDEO TRACK
EFFECTIVE VIDEO 14.8mm
TAPE SPEED 95.3mm/sec
TAPE WIDTH, 19mm
VIDEO TRACK
0.052mm
READING SPEED 10.26m/sec
0.085mm
0.35mm
AUDIO CH-2 PB HEAD
0.4
0.8
0.7
0.8
0.2
AUDIO CH-2 TRACK
AUDIO CH-1 TRACK
AUDIO CH-1 PB HEAD

OVERALL
BLOCK DIAGRAM

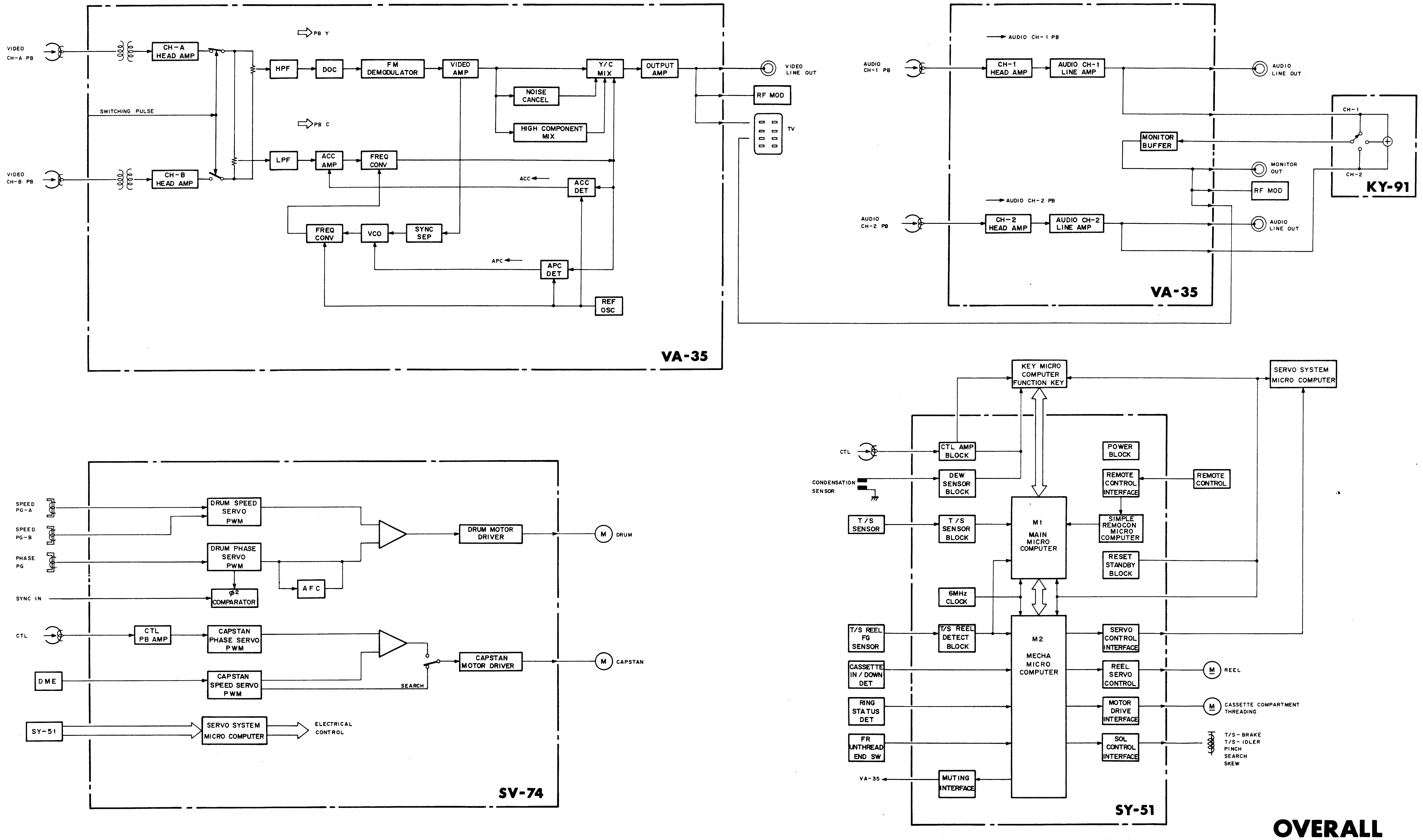


VIDEO CH-A PB
VIDEO CH-B PB
CH-A HEAD AMP
CH-B HEAD AMP
SWITCHING PULSE
PB Y
PB C
HPF
DOC
FM DEMODULATOR
VIDEO AMP
NOISE CANCEL
HIGH COMPONENT MIX
Y/C MIX
OUTPUT AMP
RF M
LPF
ACC AMP
FREQ CONV
ACC
ACC DET
FREQ CONV
VCO
SYNC SEP
APC
APC DET
REF OSC
VA-35



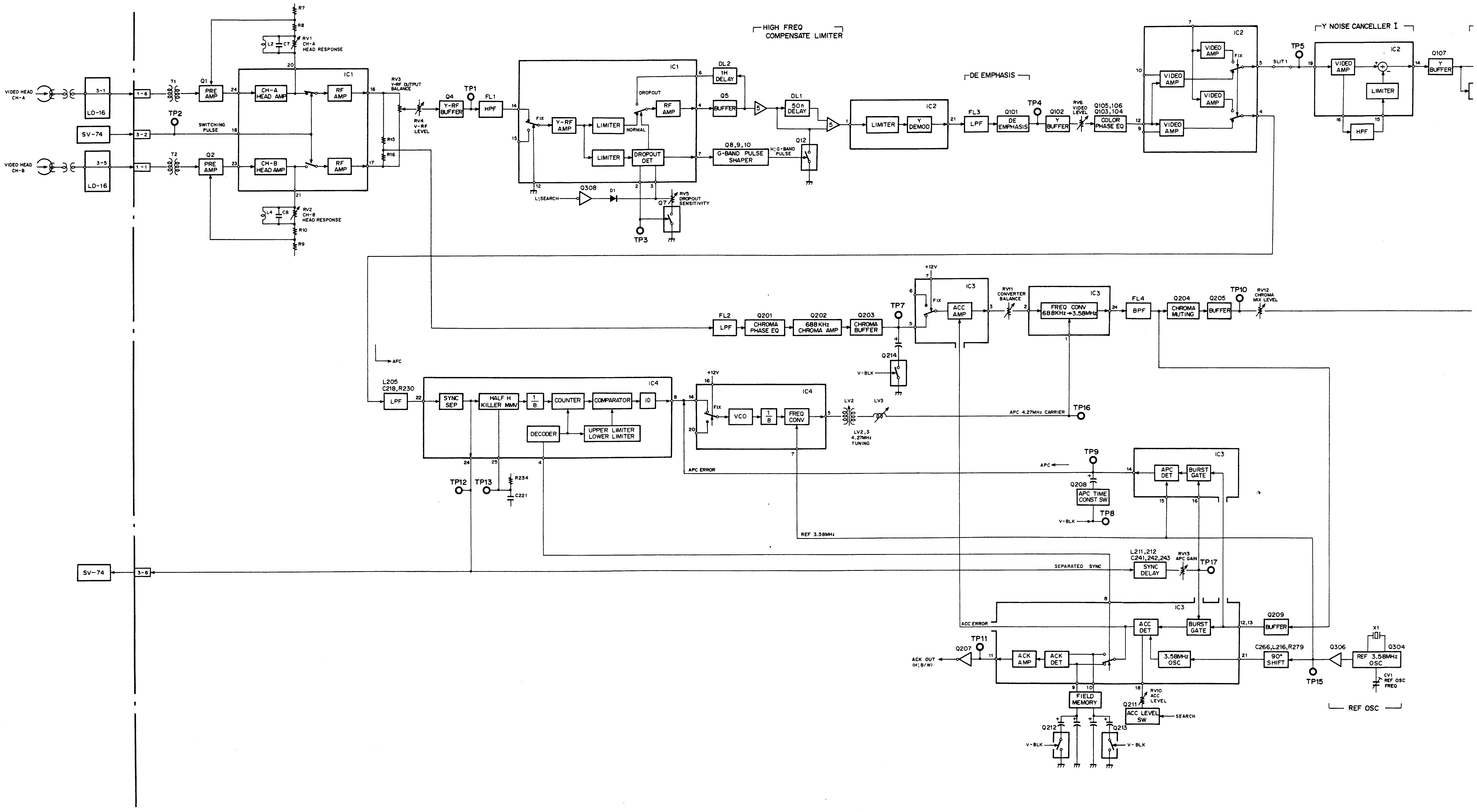
SPEED PG-A
SPEED PG-B
PHASE PG
SYNC IN
CTL
DME
SY-51
DRUM SPEED SERVO PWM
DRUM PHASE SERVO PWM
φ2 COMPARATOR
AFC
DRUM MOTOR DRIVER
M
DRUM
CTL PB AMP
CAPSTAN PHASE SERVO PWM
CAPSTAN SPEED SERVO PWM
SEARCH
CAPSTAN MOTOR DRIVER
M
CAPSTAN
SERVO SYSTEM MICRO COMPUTER
ELECTRICAL CONTROL
SV-74

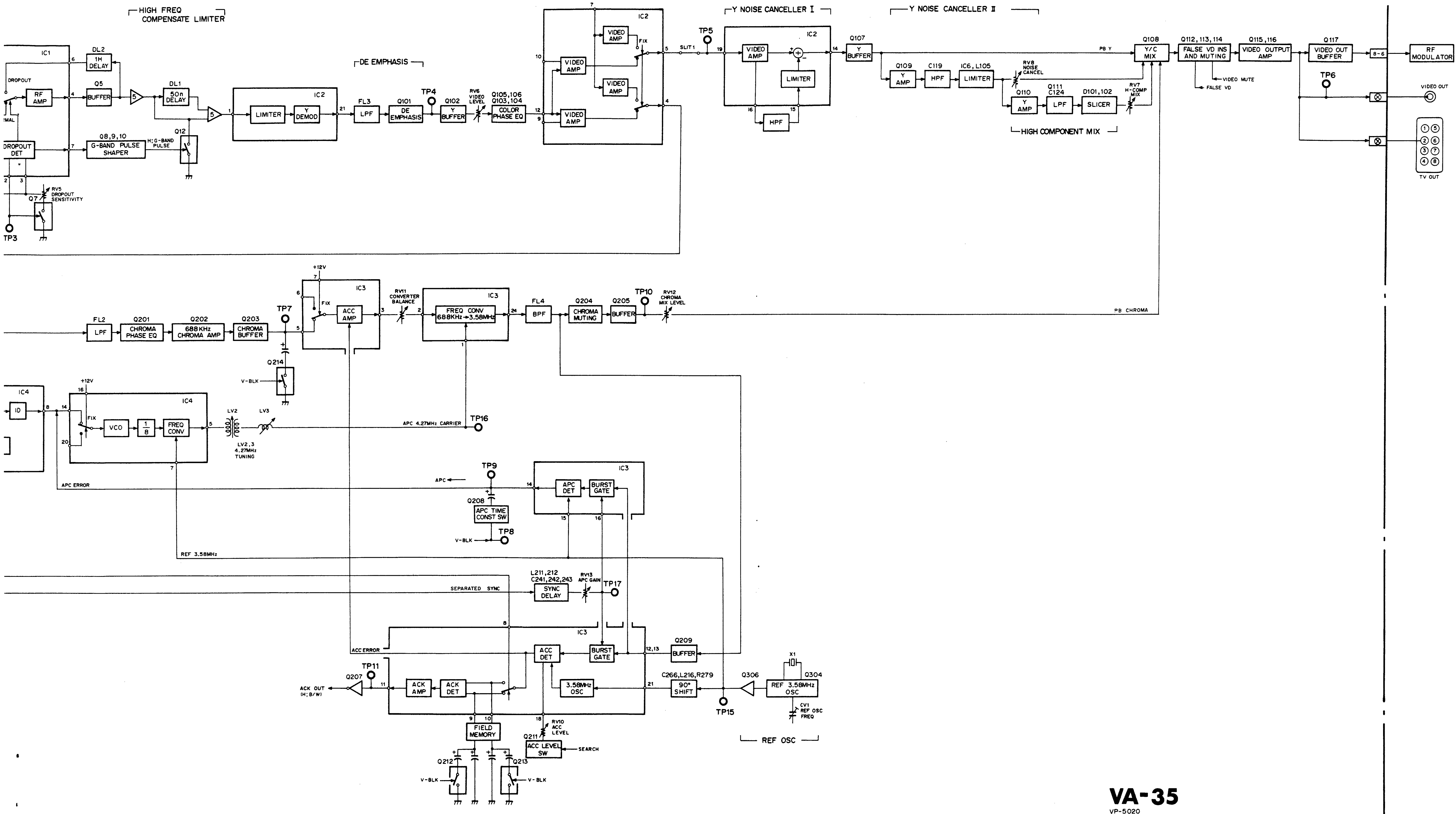
OVERALL
BLOCK DIAGRAM


VIDEO CH-A PB
CH-A HEAD AMP
PB Y
HPF
DOC
FM DEMODULATOR
VIDEO AMP
Y/C MIX
OUTPUT AMP
VIDEO LINE OUT
RF MOD
TV
NOISE CANCEL
HIGH COMPONENT MIX
SWITCHING PULSE
PB C
LPF
ACC AMP
FREQ CONV
ACC
ACC DET
VIDEO CH-B PB
CH-B HEAD AMP
FREQ CONV
VCO
SYNC SEP
APC
APC DET
REF OSC
VA-35
AUDIO CH-1 PB
AUDIO CH-1 PB
CH-1 HEAD AMP
AUDIO CH-1 LINE AMP
AUDIO LINE OUT
CH-1
MONITOR BUFFER
MONITOR OUT
RF MOD
CH-2
KY-91
AUDIO CH-2 PB
AUDIO CH-2 PB
CH-2 HEAD AMP
AUDIO CH-2 LINE AMP
AUDIO LINE OUT
VA-35
SPEED PG-A
SPEED PG-B
PHASE PG
DRUM SPEED SERVO PWM
DRUM PHASE SERVO PWM
AFC
DRUM MOTOR DRIVER
M
DRUM
SYNC IN
φ2 COMPARATOR
CTL
CTL PB AMP
CAPSTAN PHASE SERVO PWM
CAPSTAN MOTOR DRIVER
M
CAPSTAN
DME
CAPSTAN SPEED SERVO PWM
SEARCH
SY-51
SERVO SYSTEM MICRO COMPUTER
ELECTRICAL CONTROL
SV-74
KEY MICRO COMPUTER FUNCTION KEY
SERVO SYSTEM MICRO COMPUTER
CTL
CTL AMP BLOCK
POWER BLOCK
CONDENSATION SENSOR
DEW SENSOR BLOCK
REMOTE CONTROL INTERFACE
REMOTE CONTROL
T/S SENSOR
T/S SENSOR BLOCK
M1 MAIN MICRO COMPUTER
SIMPLE REMOCON MICRO COMPUTER
RESET STANDBY BLOCK
6MHz CLOCK
T/S REEL FG SENSOR
T/S REEL DETECT BLOCK
M2 MECHA MICRO COMPUTER
SERVO CONTROL INTERFACE
CASSETTE IN / DOWN DET
REEL SERVO CONTROL
M
REEL
RING STATUS DET
MOTOR DRIVE INTERFACE
M
CASSETTE COMPARTMENT THREADING
FR UNTHREAD END SW
SOL CONTROL INTERFACE
T/S-BRAKE
T/S-IDLER
PINCH
SEARCH
SKEW
VA-35
MUTING INTERFACE
SY-51

OVERALL
VP-5020

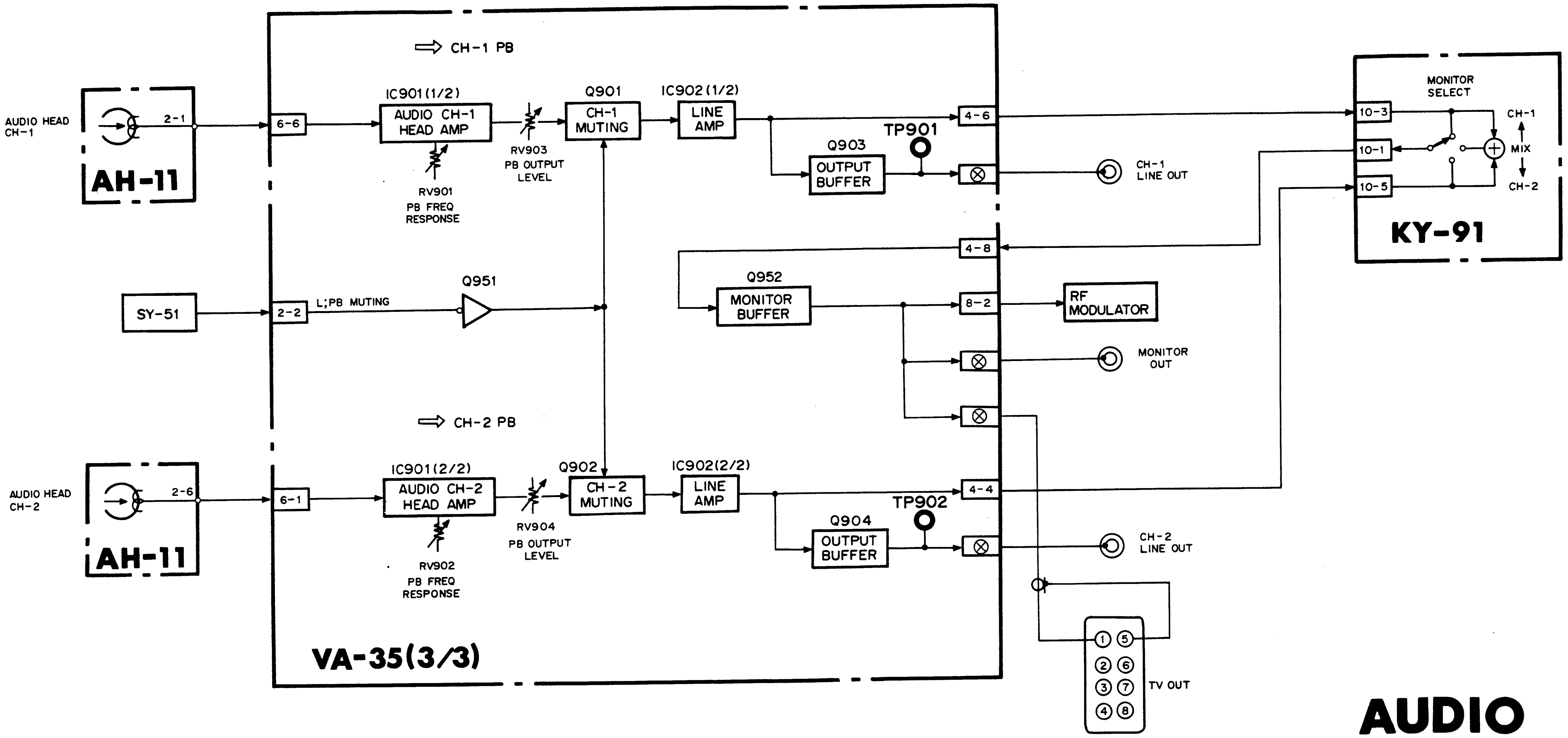
VIDEO SYSTEM BLOCK DIAGRAM


VIDEO HEAD CH-A
VIDEO HEAD CH-B
LD-16
3-1
3-5
SV-74
1-6
3-2
1-1
3-6
T1
T2
Q1
PRE AMP
Q2
PRE AMP
TP2
SWITCHING PULSE
IC1
CH-A HEAD AMP
CH-B HEAD AMP
RF AMP
R7
R8
L2
C7
RV1 CH-A HEAD RESPONSE
L4
C8
RV2 CH-B HEAD RESPONSE
R10
R9
RV3 Y-RF OUTPUT BALANCE
RV4 V-RF LEVEL
R15
R16
Q4
Y-RF BUFFER
TP1
FL1
HPF
FIX
Y-RF AMP
LIMITER
NORMAL
DROPOUT
DROPOUT DET
L: SEARCH
Q308
D1
Q7
RV5 DROPOUT SENSITIVITY
TP3
DL2
1H DELAY
Q5
BUFFER
Q8,9,10
G-BAND PULSE SHAPER
H: G-BAND PULSE
Q12
HIGH FREQ COMPENSATE LIMITER
DL1
50n DELAY
IC2
Y DEMOD
DE EMPHASIS
FL3
LPF
Q101
DE EMPHASIS
TP4
Q102
Y BUFFER
RV6 VIDEO LEVEL
Q105,106
Q103,104
COLOR PHASE EQ
VIDEO AMP
TP5
SLIT 1
Y NOISE CANCELLER I
HPF
Q107
Y BUFFER
AFC
L205
C218,R230
IC4
SYNC SEP
HALF H KILLER MMV
1/8
COUNTER
COMPARATOR
ID
DECODER
UPPER LIMITER
LOWER LIMITER
TP12
TP13
R234
C221
+12V
VCO
FREQ CONV
LV2
LV3
LV2,3 4.27MHz TUNING
APC 4.27MHz CARRIER
TP16
FL2
Q201
CHROMA PHASE EQ
Q202
688KHz CHROMA AMP
Q203
CHROMA BUFFER
TP7
Q214
V-BLK
IC3
ACC AMP
RV11 CONVERTER BALANCE
FREQ CONV 688KHz→3.58MHz
FL4
BPF
Q204
CHROMA MUTING
Q205
BUFFER
TP10
RV12 CHROMA MIX LEVEL
APC ERROR
APC
TP9
Q208
APC TIME CONST SW
TP8
APC DET
BURST GATE
REF 3.58MHz
SEPARATED SYNC
L211,212
C241,242,243
SYNC DELAY
RV13 APC GAIN
TP17
ACC ERROR
ACC DET
3.58MHz OSC
Q209
C266,L216,R279
90° SHIFT
TP15
Q306
X1
Q304
REF 3.58MHz OSC
CV1 REF OSC FREQ
REF OSC
TP11
Q207
ACK OUT (H; B/W)
ACK AMP
ACK DET
FIELD MEMORY
RV10 ACC LEVEL
Q211
ACC LEVEL SW
SEARCH
Q212
Q213


HIGH FREQ COMPENSATE LIMITER
IC1
DROPOUT
RF AMP
DROPOUT DET
DL2
1H DELAY
Q5
BUFFER
DL1
50n DELAY
Q8,9,10
G-BAND PULSE SHAPER
H: G-BAND PULSE
Q12
Q7
RV5 DROPOUT SENSITIVITY
TP3
IC2
LIMITER
Y DEMOD
DE EMPHASIS
FL3
LPF
Q101
DE EMPHASIS
TP4
Q102
Y BUFFER
RV6 VIDEO LEVEL
Q105,106 Q103,104
COLOR PHASE EQ
VIDEO AMP
FIX
TP5
SLIT 1
Y NOISE CANCELLER I
LIMITER
HPF
Q107
Y BUFFER
Y NOISE CANCELLER II
Q109
Y AMP
C119
HPF
IC6, L105
LIMITER
RV8 NOISE CANCEL
Q110
Y AMP
Q111 C124
LPF
D101,102
SLICER
RV7 H-COMP MIX
HIGH COMPONENT MIX
PB Y
Q108
Y/C MIX
Q112,113,114
FALSE VD INS AND MUTING
VIDEO MUTE
FALSE VD
Q115,116
VIDEO OUTPUT AMP
Q117
VIDEO OUT BUFFER
TP6
8-6
RF MODULATOR
VIDEO OUT
TV OUT
+12V
IC3
FIX
ACC AMP
RV11 CONVERTER BALANCE
FREQ CONV 688KHz→3.58MHz
FL4
BPF
Q204
CHROMA MUTING
Q205
BUFFER
TP10
RV12 CHROMA MIX LEVEL
PB CHROMA
FL2
LPF
Q201
CHROMA PHASE EQ
Q202
688KHz CHROMA AMP
Q203
CHROMA BUFFER
TP7
Q214
V-BLK
IC4
ID
VCO
1/8
FREQ CONV
LV2
LV3
LV2,3 4.27MHz TUNING
APC 4.27MHz CARRIER
TP16
TP9
APC
APC DET
BURST GATE
Q208
APC TIME CONST SW
TP8
APC ERROR
REF 3.58MHz
SEPARATED SYNC
L211,212 C241,242,243
SYNC DELAY
RV13 APC GAIN
TP17
ACC ERROR
ACC DET
BURST GATE
Q209
BUFFER
TP11
Q207
ACK OUT (H: B/W)
ACK AMP
ACK DET
3.58MHz OSC
C266,L216,R279
90° SHIFT
TP15
Q306
X1
Q304
REF 3.58MHz OSC
CV1 REF OSC FREQ
REF OSC
FIELD MEMORY
RV10 ACC LEVEL
Q211
ACC LEVEL SW
SEARCH
Q212
Q213

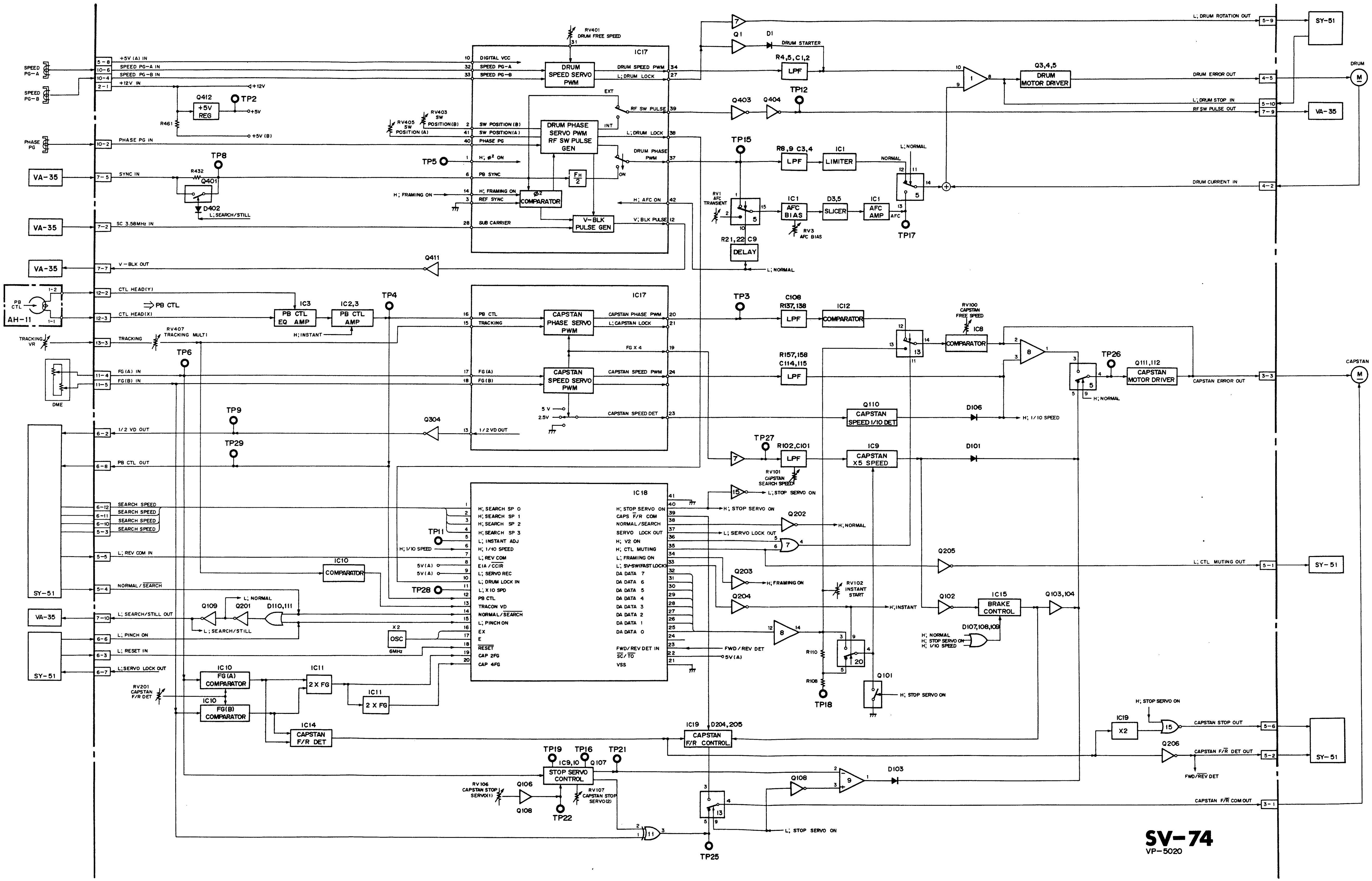
VA-35
VP-5020

AUDIO SYSTEM
BLOCK DIAGRAM


AUDIO HEAD CH-1
2-1
AH-11
AUDIO HEAD CH-2
2-6
AH-11
SY-51
⇨ CH-1 PB
6-6
IC901(1/2)
AUDIO CH-1 HEAD AMP
RV901
PB FREQ RESPONSE
RV903
PB OUTPUT LEVEL
Q901
CH-1 MUTING
IC902(1/2)
LINE AMP
Q903
OUTPUT BUFFER
TP901
4-6
2-2
L;PB MUTING
Q951
4-8
Q952
MONITOR BUFFER
8-2
⇨ CH-2 PB
6-1
IC901(2/2)
AUDIO CH-2 HEAD AMP
RV902
PB FREQ RESPONSE
RV904
PB OUTPUT LEVEL
Q902
CH-2 MUTING
IC902(2/2)
LINE AMP
Q904
OUTPUT BUFFER
TP902
4-4
VA-35(3/3)
CH-1 LINE OUT
RF MODULATOR
MONITOR OUT
CH-2 LINE OUT
①⑤
②⑥
③⑦
④⑧
TV OUT
MONITOR SELECT
10-3
10-1
10-5
CH-1
MIX
CH-2
KY-91

AUDIO
VP-5020

SERVO SYSTEM
BLOCK DIAGRAM


SPEED PG-A
SPEED PG-B
PHASE PG
VA-35
AH-11
PB CTL
TRACKING VR
DME
SY-51
+5V (A) IN
SPEED PG-A IN
SPEED PG-B IN
+12V IN
PHASE PG IN
SYNC IN
SC 3.58MHz IN
V-BLK OUT
CTL HEAD(Y)
CTL HEAD(X)
TRACKING
FG(A) IN
FG(B) IN
1/2 VD OUT
PB CTL OUT
SEARCH SPEED
L; REV COM IN
NORMAL/SEARCH
L; SEARCH/STILL OUT
L; PINCH ON
L; RESET IN
L; SERVO LOCK OUT
Q412
+5V REG
TP2
R461
+5V (B)
R432
Q401
D402
L; SEARCH/STILL
TP8
TP5
RV401 DRUM FREE SPEED
RV403 SW POSITION(B)
RV405 SW POSITION (A)
IC17
DIGITAL VCC
SPEED PG-A
SPEED PG-B
DRUM SPEED SERVO PWM
DRUM SPEED PWM
L; DRUM LOCK
SW POSITION (B)
SW POSITION (A)
PHASE PG
H; φ2 ON
PB SYNC
H; FRAMING ON
REF SYNC
SUB CARRIER
DRUM PHASE SERVO PWM RF SW PULSE GEN
FH/2
φ2 COMPARATOR
V-BLK PULSE GEN
EXT
INT
RF SW PULSE
DRUM PHASE PWM
H; AFC ON
V; BLK PULSE
Q411
IC3 PB CTL EQ AMP
IC2,3 PB CTL AMP
H; INSTANT
TP4
RV407 TRACKING MULTI
TP6
TP9
TP29
Q304
CAPSTAN PHASE SERVO PWM
CAPSTAN PHASE PWM
L; CAPSTAN LOCK
FG X 4
CAPSTAN SPEED SERVO PWM
CAPSTAN SPEED PWM
CAPSTAN SPEED DET
1/2 VD OUT
IC18
H; SEARCH SP 0
H; SEARCH SP 1
H; SEARCH SP 2
H; SEARCH SP 3
L; INSTANT ADJ
H; 1/10 SPEED
L; REV COM
EIA/CCIR
L; SERVO REC
L; DRUM LOCK IN
L; X10 SPD
PB CTL
TRACON VD
NORMAL/SEARCH
L; PINCH ON
EX
E
RESET
CAP 2FG
CAP 4FG
H; STOP SERVO ON
CAPS F/R COM
NORMAL/SEARCH
SERVO LOCK OUT
H; V2 ON
H; CTL MUTING
L; FRAMING ON
L; SV-SW(FAST LOCK)
DA DATA 7
DA DATA 6
DA DATA 5
DA DATA 4
DA DATA 3
DA DATA 2
DA DATA 1
DA DATA 0
FWD/REV DET IN
SC/TO
VSS
TP11
TP28
X2 OSC 6MHz
IC10 COMPARATOR
Q109
Q201
D110,111
L; NORMAL
IC10 FG(A) COMPARATOR
IC10 FG(B) COMPARATOR
RV201 CAPSTAN F/R DET
IC11 2 X FG
IC14 CAPSTAN F/R DET
TP19
TP16
TP21
IC9,10
Q107
STOP SERVO CONTROL
RV106 CAPSTAN STOP SERVO(1)
Q106
Q108
RV107 CAPSTAN STOP SERVO(2)
TP22
Q1
D1
DRUM STARTER
R4,5,C1,2 LPF
Q403
Q404
TP12
TP15
R8,9 C3,4 LPF
IC1 LIMITER
NORMAL
L; NORMAL
RV1 AFC TRANSIENT
IC1 AFC BIAS
D3,5 SLICER
IC1 AFC AMP
RV3 AFC BIAS
TP17
R21,22 C9 DELAY
DRUM CURRENT IN
Q3,4,5 DRUM MOTOR DRIVER
L; DRUM ROTATION OUT
DRUM ERROR OUT
L; DRUM STOP IN
RF SW PULSE OUT
DRUM
TP3
C106 R137,138 LPF
IC12 COMPARATOR
RV100 CAPSTAN FREE SPEED
IC8 COMPARATOR
TP26
Q111,112 CAPSTAN MOTOR DRIVER
CAPSTAN ERROR OUT
CAPSTAN
H; NORMAL
R157,158 C114,115 LPF
Q110 CAPSTAN SPEED 1/10 DET
D106
H; 1/10 SPEED
TP27
R102,C101 LPF
RV101 CAPSTAN SEARCH SPEED
IC9 CAPSTAN X5 SPEED
D101
L; STOP SERVO ON
H; STOP SERVO ON
Q202
H; NORMAL
L; SERVO LOCK OUT
Q205
L; CTL MUTING OUT
Q203
H; FRAMING ON
RV102 INSTANT START
Q204
H; INSTANT
Q102
IC15 BRAKE CONTROL
Q103,104
D107,108,109
H; NORMAL
H; STOP SERVO ON
H; 1/10 SPEED
R110
R108
TP18
Q101
FWD/REV DET
5V(A)
IC19 CAPSTAN F/R CONTROL
D204,205
IC19 X2
CAPSTAN STOP OUT
Q206
CAPSTAN F/R DET OUT
FWD/REV DET
D103
CAPSTAN F/R COM OUT
TP25
SV-74
VP-5020

SECTION 13
SEMICONDUCTOR ELECTRODES

ここに記載されているIC，トランジスタ，ダイオードは，それぞれの機能を等価的に表わしたものです。したがって互換性を表わすものではありません。（互換性のない型名が併記されている事もあります。）部品の交換をする時は，SPARE PARTSの章を参照して下さい。

ICs, transistors and diodes of which functions are equivalently indicated are described here. Therefore, incompatible device names may be described together. For parts replacement, refer to the Spare Parts section in this manual.

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CX859	13-2
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HD14013BP	13-4
HD14538BP	13-9
LA3160	13-2
LA3161	13-2
M54516P	13-2
M54543L	13-7
MB84013B	13-4
MB84013M	13-4
MB8747	13-4
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MB88505-442M	13-5
MB8851H-1015M	13-7
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MC10116L	13-2
NJM2903D	13-8
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NJM4558S	13-8
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TC4001BP	13-8
TC4001UBP	13-8
TC4030BP	13-9
TC4053BP	13-8
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2SA1115	13-10
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2SC2785-E	13-10
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2SD998	13-10
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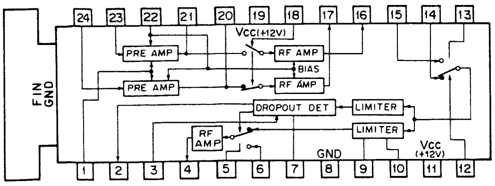
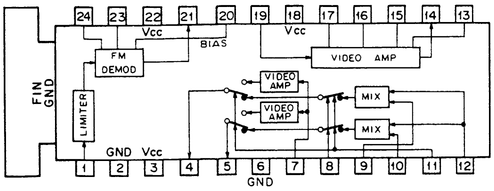
DTA124XS	13-10
DTC124XS	13-10
DTC144ES	13-10

DIODE	PAGE
10E-2	13-11
1SS119	13-11
BR5104S	13-11
EAA5504S	13-11
EBG5504S	13-11
GL-5HD5	13-11
PS4005-S	13-11
RD3.9E-B	13-11
SPS102-A	13-11
U05G	13-11

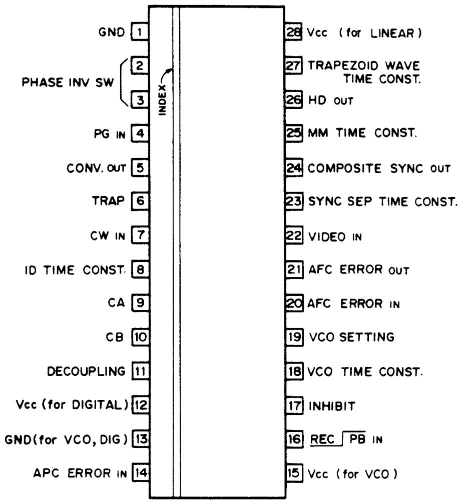
CX134A (SONY)
HEAD AMP/DROPOUT COMPENSATOR
— TOP VIEW —

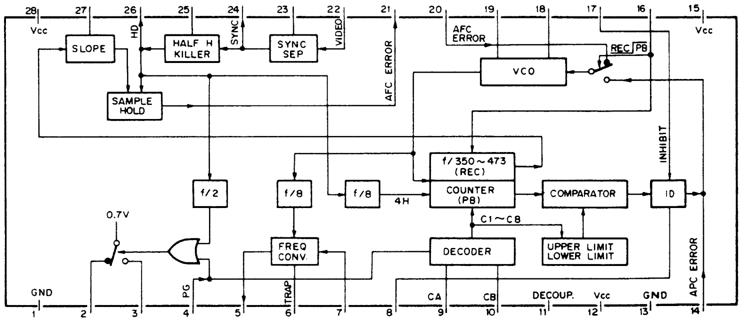

24
23
22
21
20
19
18
17
16
15
14
13
Vcc(+12V)
PRE AMP
RF AMP
BIAS
PRE AMP
RF AMP
FIN GND
DROPOUT DET
LIMITER
LIMITER
RF AMP
GND
Vcc (+12V)
1
2
3
4
5
6
7
8
9
10
11
12

CX135 (SONY)
— TOP VIEW —

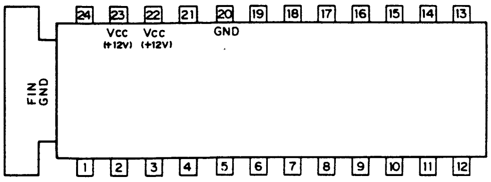

24
23
22
21
20
19
18
17
16
15
14
13
Vcc
Vcc
BIAS
FM DEMOD
VIDEO AMP
FIN GND
VIDEO AMP
VIDEO AMP
MIX
MIX
LIMITER
GND Vcc
1
2
3
4
5
6
7
8
9
10
11
12
GND

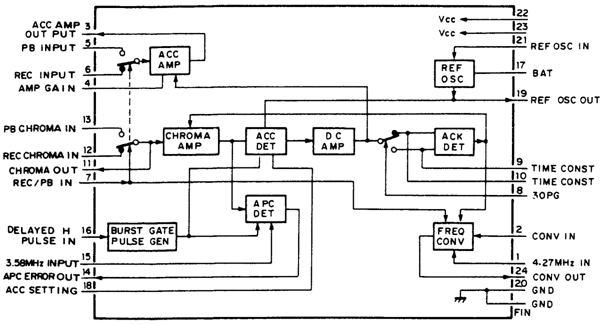
CX 859 (SONY)
— TOP VIEW —


GND 1
PHASE INV SW 2
3
PG IN 4
CONV. OUT 5
TRAP 6
CW IN 7
ID TIME CONST. 8
CA 9
CB 10
DECOUPLING 11
Vcc (for DIGITAL) 12
GND(for VCO, DIG) 13
APC ERROR IN 14
INDEX
28 Vcc (for LINEAR)
27 TRAPEZOID WAVE TIME CONST.
26 HD OUT
25 MM TIME CONST.
24 COMPOSITE SYNC OUT
23 SYNC SEP TIME CONST.
22 VIDEO IN
21 AFC ERROR OUT
20 AFC ERROR IN
19 VCO SETTING
18 VCO TIME CONST.
17 INHIBIT
16 REC / PB IN
15 Vcc (for VCO)


28
27
26
25
24
23
22
21
20
19
18
17
16
15
Vcc
HD
SLOPE
HALF H KILLER
SYNC
SYNC SEP
VIDEO
AFC ERROR
AFC ERROR
VCO
REC/PB
Vcc
SAMPLE HOLD
INHIBIT
f/350~473 (REC)
COUNTER (PB)
f/2
f/8
f/8
4H
COMPARATOR
ID
0.7V
C1~C8
FREQ CONV.
DECODER
UPPER LIMIT LOWER LIMIT
APC ERROR
GND
PG
TRAP
CA
CB
DECOUP.
Vcc
GND
1
2
3
4
5
6
7
8
9
10
11
12
13
14

CX188
CHROMINANCE SIGNAL PROCESSER
— TOP VIEW —


24
23
22
21
20
19
18
17
16
15
14
13
Vcc (+12V)
Vcc (+12V)
GND
FIN GND
1
2
3
4
5
6
7
8
9
10
11
12


ACC AMP OUT PUT 3
PB INPUT 5
REC INPUT 6
AMP GAIN 4
ACC AMP
PB CHROMA IN 13
REC CHROMA IN 12
CHROMA OUT 11
REC/PB IN 7
CHROMA AMP
ACC DET
DC AMP
ACK DET
APC DET
DELAYED H PULSE IN 16
BURST GATE PULSE GEN
3.58MHz INPUT 15
APC ERROR OUT 14
ACC SETTING 18
Vcc 22
Vcc 23
21 REF OSC IN
REF OSC
17 BAT
19 REF OSC OUT
9 TIME CONST
10 TIME CONST
8 30PG
FREQ CONV
2 CONV IN
1 4.27MHz IN
24 CONV OUT
20 GND
GND
FIN

DECODER TRUTH TABLE

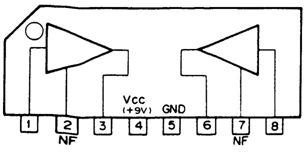
CB / CA	LOW	OPEN	HIGH
LOW	C1	C7	—
OPEN	C4	C5	C6
HIGH	—	*C2 C3	C8

* PG : L--- C2
PG : H--- C3

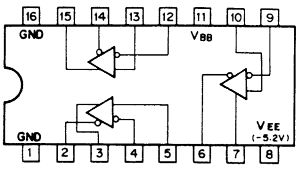
AFC/APC PRESET DATA

	AFC COUNT DOWN	APC ID COUNT	
		UPPER LIM.	LOWER LIM.
C1	f/473	105	95
C2	f/351	129	119
C3	f/353	137	127
C4	f/351	118	104
C5	f/351	131	117
C6	f/351	144	130
C7	f/350	136	104
C8	——	125	115

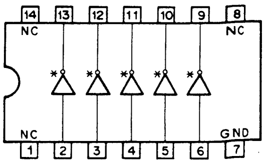
LA3160 (SANYO)
LA3161 (SANYO)
2-CHANNEL PREAMPLIFIER
— SIDE VIEW —


Vcc (+9V)
GND
1
2
3
4
5
6
7
8
NF
NF

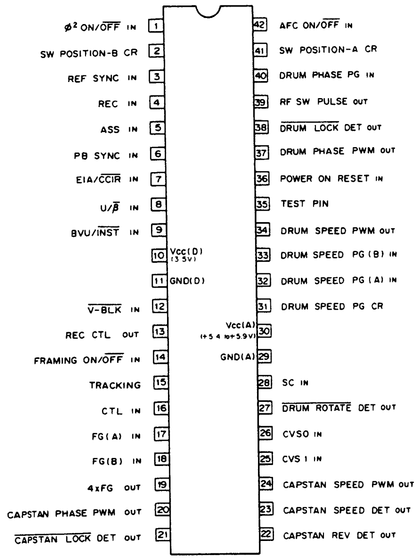
HD10116 (HITACHI)
MC10116L (MOTOROLA)
ECL DIFFERENTIAL OR/NOR LINE RECEIVER
— TOP VIEW —

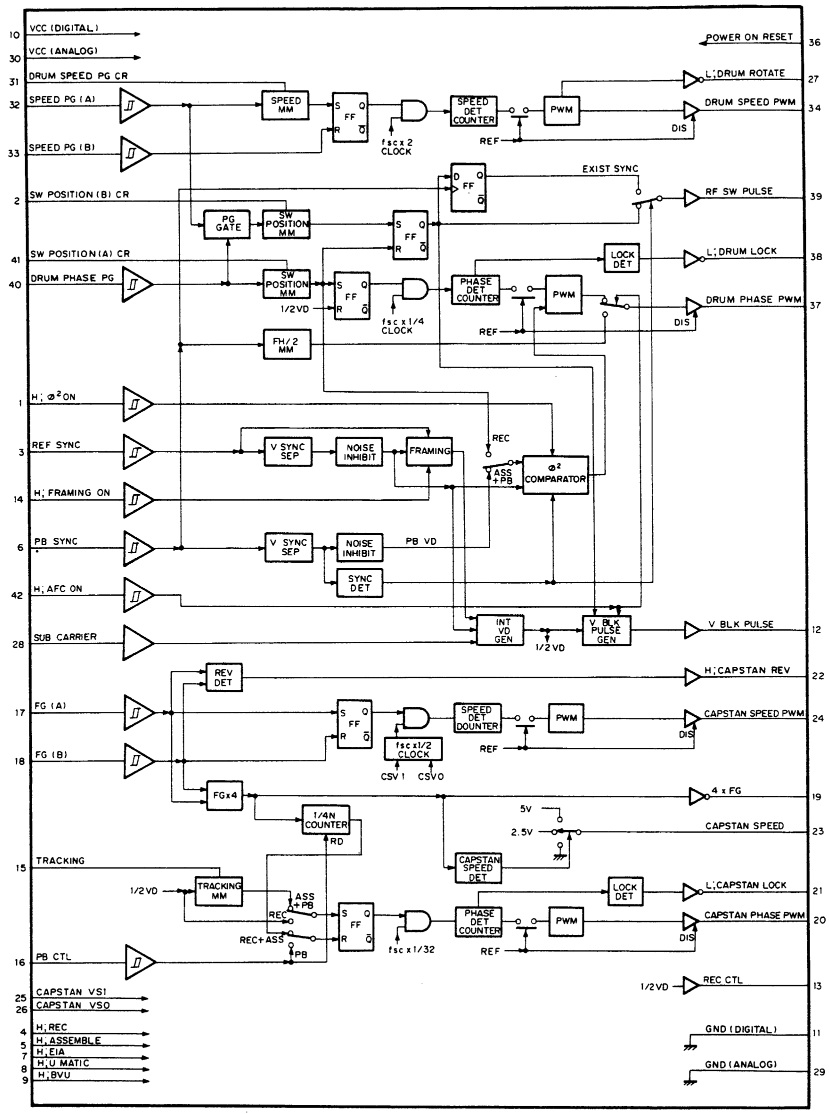

16
15
14
13
12
11
10
9
GND
VBB
GND
VEE (-5.2V)
1
2
3
4
5
6
7
8

M54516P (MITSUBISHI)
INVERTER WITH OPEN-COLLECTOR
(DARLINGTON-CONNECTED TRANSISTOR ARRAY)
— TOP VIEW —

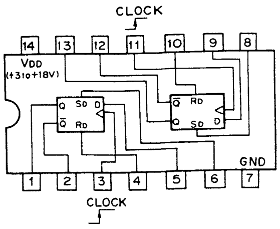

14
13
12
11
10
9
8
NC
NC
NC
GND
1
2
3
4
5
6
7

CX194B (SONY)
DRUM/CAPSTAN PWM SERVO
— TOP VIEW —


1 ø² ON/OFF IN
2 SW POSITION-B CR
3 REF SYNC IN
4 REC IN
5 ASS IN
6 PB SYNC IN
7 EIA/CCIR IN
8 U/β IN
9 BVU/INST IN
10 Vcc(D) (3.5V)
11 GND(D)
12 V-BLK IN
13 REC CTL OUT
14 FRAMING ON/OFF IN
15 TRACKING
16 CTL IN
17 FG(A) IN
18 FG(B) IN
19 4xFG OUT
20 CAPSTAN PHASE PWM OUT
21 CAPSTAN LOCK DET OUT
22 CAPSTAN REV DET OUT
23 CAPSTAN SPEED DET OUT
24 CAPSTAN SPEED PWM OUT
25 CVS 1 IN
26 CVSO IN
27 DRUM ROTATE DET OUT
28 SC IN
29 GND(A)
30 Vcc(A) (+5.4 to +5.9V)
31 DRUM SPEED PG CR
32 DRUM SPEED PG (A) IN
33 DRUM SPEED PG (B) IN
34 DRUM SPEED PWM OUT
35 TEST PIN
36 POWER ON RESET IN
37 DRUM PHASE PWM OUT
38 DRUM LOCK DET OUT
39 RF SW PULSE OUT
40 DRUM PHASE PG IN
41 SW POSITION-A CR
42 AFC ON/OFF IN


10 VCC (DIGITAL)
30 VCC (ANALOG)
31 DRUM SPEED PG CR
32 SPEED PG (A)
33 SPEED PG (B)
2 SW POSITION (B) CR
41 SW POSITION (A) CR
40 DRUM PHASE PG
1 H; ø²ON
3 REF SYNC
14 H; FRAMING ON
6 PB SYNC
42 H; AFC ON
28 SUB CARRIER
17 FG (A)
18 FG (B)
15 TRACKING
16 PB CTL
25 CAPSTAN VS1
26 CAPSTAN VSO
4 H; REC
5 H; ASSEMBLE
7 H; EIA
8 H; U MATIC
9 H; BVU
SPEED MM
FF
S
R
Q
Q̄
fsc x 2 CLOCK
SPEED DET COUNTER
PWM
REF
DIS
D
PG GATE
SW POSITION MM
EXIST SYNC
LOCK DET
PHASE DET COUNTER
1/2VD
fsc x 1/4 CLOCK
FH/2 MM
REC
ASS +PB
ø² COMPARATOR
V SYNC SEP
NOISE INHIBIT
FRAMING
PB VD
SYNC DET
INT VD GEN
1/2 VD
V BLK PULSE GEN
REV DET
SPEED DET DOUNTER
fsc x1/2 CLOCK
CSV 1
CSVO
FGx4
1/4N COUNTER
RD
5V
2.5V
CAPSTAN SPEED DET
TRACKING MM
ASS +PB
REC
REC+ASS
PB
fsc x 1/32
1/2VD
POWER ON RESET 36
L; DRUM ROTATE 27
DRUM SPEED PWM 34
RF SW PULSE 39
L; DRUM LOCK 38
DRUM PHASE PWM 37
V BLK PULSE 12
H; CAPSTAN REV 22
CAPSTAN SPEED PWM 24
4 x FG 19
CAPSTAN SPEED 23
L; CAPSTAN LOCK 21
CAPSTAN PHASE PWM 20
REC CTL 13
GND (DIGITAL) 11
GND (ANALOG) 29

CD4013AE/BE (RCA)
HD14013BP (HITACHI)
MB84013B (FUJITSU)
MB84013M (FUJITSU)
C-MOS D-TYPE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —


CLOCK
14
13
12
11
10
9
8
VDD
(+3 to +18V)
Q
SD
D
Q̄
RD
Q̄
RD
Q
SD
D
GND
1
2
3
4
5
6
7
CLOCK

DIRECT R-S FLIP FLOP

SD	RD	Q	$\overline{Q}$
0	0	Qn	$\overline{Qn}$
0	1	0	1
1	0	1	0
1	1	1	1

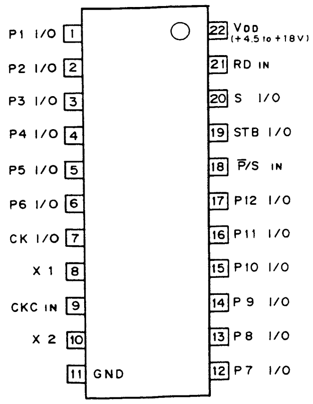
0; LOW LEVEL
1; HIGH LEVEL

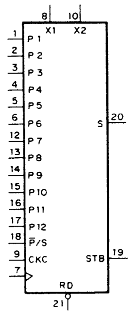
D-TYPE FLIP FLOP

CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK; __/‾‾
CKn; BEFORE CLOCK
CKn+1; AFTER CLOCK

MB8747 (FUJITSU)
C-MOS SERIAL TO/FROM PARALLEL CONVERTER WITH OSCILLATOR
— TOP VIEW —


P1 I/O 1
P2 I/O 2
P3 I/O 3
P4 I/O 4
P5 I/O 5
P6 I/O 6
CK I/O 7
X 1 8
CKC IN 9
X 2 10
11 GND
22 VDD (+4.5 to +18V)
21 RD IN
20 S I/O
19 STB I/O
18 P̄/S IN
17 P12 I/O
16 P11 I/O
15 P10 I/O
14 P 9 I/O
13 P 8 I/O
12 P 7 I/O


8
10
X1
X2
1 P1
2 P2
3 P3
4 P4
5 P5
6 P6
12 P7
13 P8
14 P9
15 P10
16 P11
17 P12
18 P̄/S
9 CKC
7
S 20
STB 19
RD
21

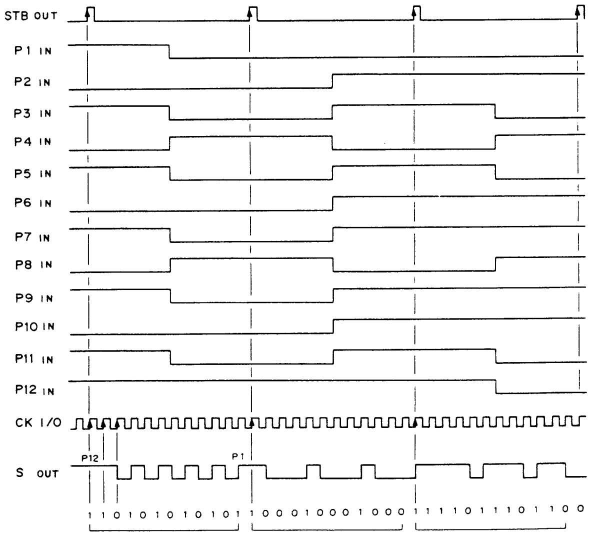
P1 to P12	; PARALLEL DATA IN/OUT
CK	; CLOCK IN/OUT
CKC	; CLOCK I/O CONTROL IN
X1,X2	; X'TAL
$\overline{P}$/S	; PARALLEL/SERIAL CONTROL IN
STB	; STROBE
S	; SERIAL DATA IN/OUT

CKC	CK
0	OUT
1	IN

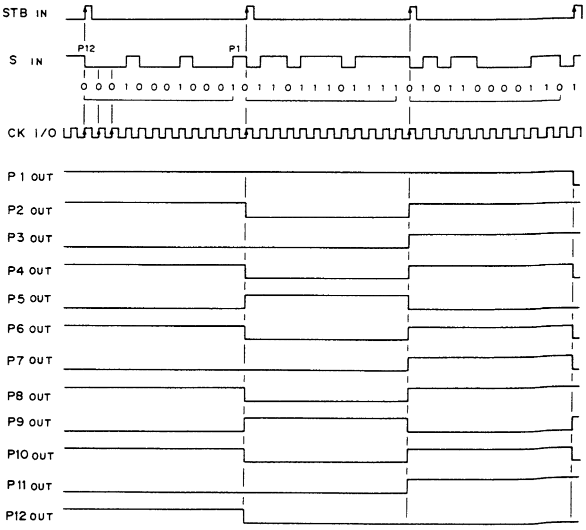
RD	$\overline{P}$/S	MODE	P1toP12	S	STB
0	0	OPEN	IN	HI-Z	OUT
0	1	RESET	0	IN	IN
1	0	P→S	IN	OUT	OUT
1	1	S→P	OUT	IN	IN

0	; LOW LEVEL
1	; HIGH LEVEL
HI-Z	; HIGH IMPEDANCE
P→S	; PARALLEL→SERIAL CONV
S→P	; SERIAL→PARALLEL CONV

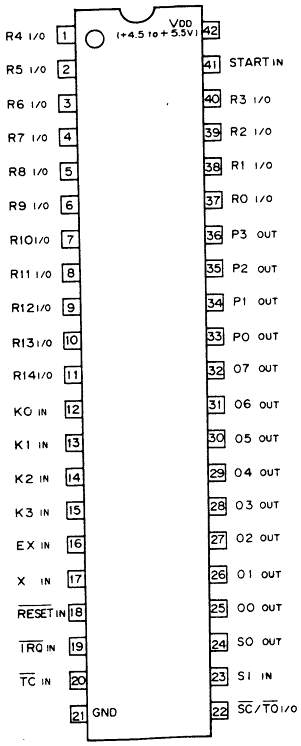
$\overline{P}$/S = 0 RD=1 (PARALLEL → SERIAL CONV)

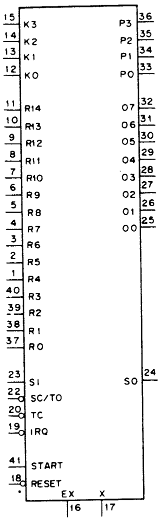

STB OUT
P1 IN
P2 IN
P3 IN
P4 IN
P5 IN
P6 IN
P7 IN
P8 IN
P9 IN
P10 IN
P11 IN
P12 IN
CK I/O
P12
P1
S OUT
1 1 0 1 0 1 0 1 0 1 0 1 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1 1 0 1 1 1 0 1 1 0 0

$\overline{P}$/S = 1 RD = 1 (SERIAL → PARALLEL CONV)


STB IN
P12
P1
S IN
0 0 0 1 0 0 0 1 0 0 0 1 0 1 1 0 1 1 1 0 1 1 1 1 0 1 0 1 1 0 0 0 0 1 1 0 1
CK I/O
P 1 OUT
P2 OUT
P3 OUT
P4 OUT
P5 OUT
P6 OUT
P7 OUT
P8 OUT
P9 OUT
P10 OUT
P11 OUT
P12 OUT

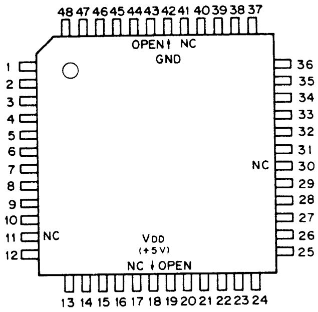
MB88505P (FUJITSU)
C-MOS 4-BIT ONE-CHIP MICROCOMPUTER
— TOP VIEW —

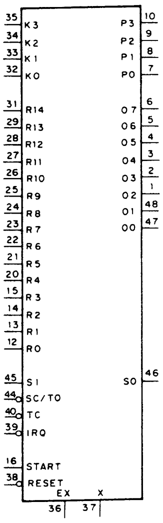

R4 I/O 1
R5 I/O 2
R6 I/O 3
R7 I/O 4
R8 I/O 5
R9 I/O 6
R10 I/O 7
R11 I/O 8
R12 I/O 9
R13 I/O 10
R14 I/O 11
K0 IN 12
K1 IN 13
K2 IN 14
K3 IN 15
EX IN 16
X IN 17
$\overline{\text{RESET}}$ IN 18
$\overline{\text{IRQ}}$ IN 19
$\overline{\text{TC}}$ IN 20
21 GND
VDD (+4.5 to +5.5V) 42
41 START IN
40 R3 I/O
39 R2 I/O
38 R1 I/O
37 R0 I/O
36 P3 OUT
35 P2 OUT
34 P1 OUT
33 P0 OUT
32 O7 OUT
31 O6 OUT
30 O5 OUT
29 O4 OUT
28 O3 OUT
27 O2 OUT
26 O1 OUT
25 O0 OUT
24 SO OUT
23 SI IN
22 $\overline{\text{SC}}$/$\overline{\text{TO}}$ I/O


15 K3
14 K2
13 K1
12 K0
11 R14
10 R13
9 R12
8 R11
7 R10
6 R9
5 R8
4 R7
3 R6
2 R5
1 R4
40 R3
39 R2
38 R1
37 R0
23 SI
22 SC/TO
20 TC
19 IRQ
41 START
18 RESET
EX 16
X 17
P3 36
P2 35
P1 34
P0 33
O7 32
O6 31
O5 30
O4 29
O3 28
O2 27
O1 26
O0 25
SO 24

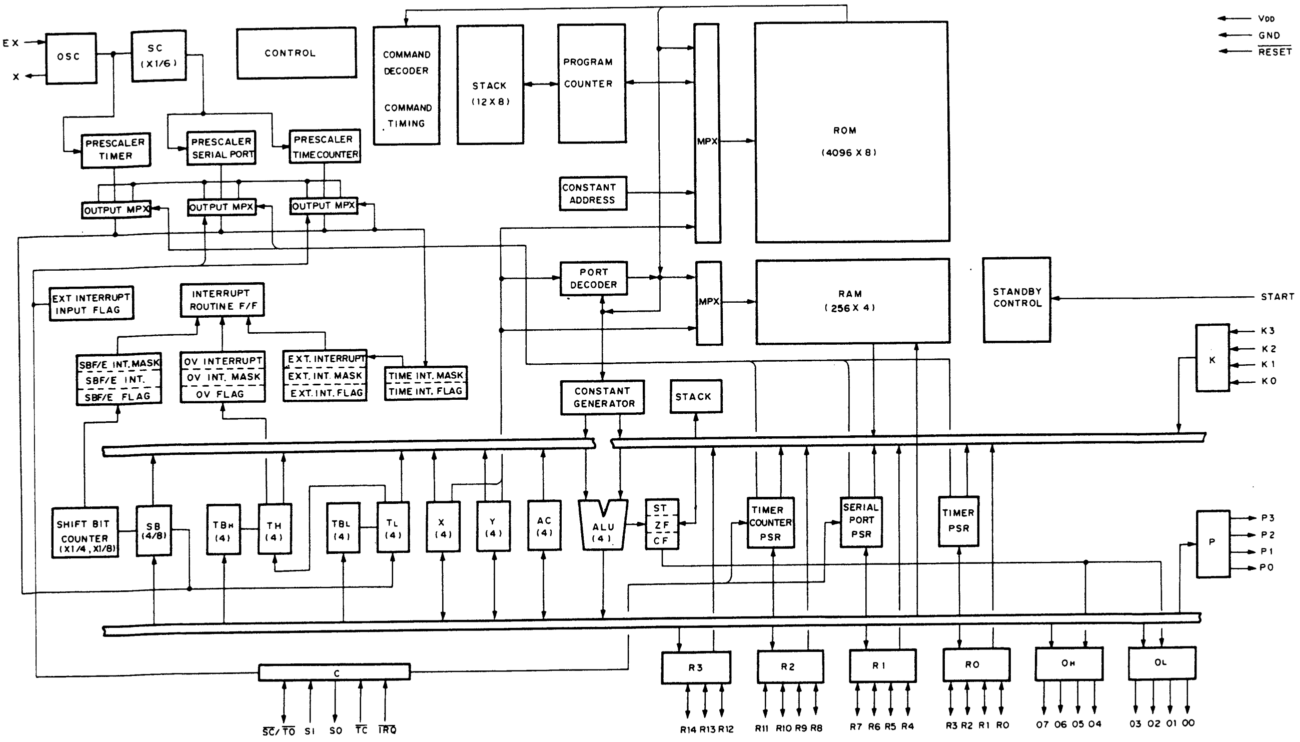
EX ; EXTERNAL CLOCK IN
$\overline{\text{IRQ}}$; INTERRUPT REQUEST IN
K0-K3 ; 4-BIT PARALLEL IN
O0-O7 ; 4-BIT PARALLEL OUT
P0-P3 ; 4-BIT PARALLEL OUT
R0-R14 ; DATA IN/OUT
$\overline{\text{RESET}}$; RESET IN
$\overline{\text{SC}}/\overline{\text{TO}}$; SHIFT CLOCK IN/INT TIMING OUT
SI ; SERIAL DATA IN
SO ; SERIAL DATA OUT
START ; STANDBY OFF IN
$\overline{\text{TC}}$; EXTERNAL CLOCK IN FOR COUNTER
X ; CLOCK OUT

— TOP VIEW —

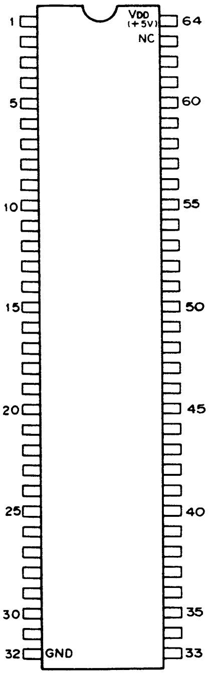

48 47 46 45 44 43 42 41 40 39 38 37
OPEN NC
GND
1 2 3 4 5 6 7 8 9 10 11 12
NC
36 35 34 33 32 31 30 29 28 27 26 25
NC
VDD (+5V)
NC OPEN
13 14 15 16 17 18 19 20 21 22 23 24


35 K3
34 K2
33 K1
32 K0
31 R14
29 R13
28 R12
27 R11
26 R10
25 R9
24 R8
23 R7
22 R6
21 R5
20 R4
15 R3
14 R2
13 R1
12 R0
45 SI
44 SC/TO
40 TC
39 IRQ
16 START
38 RESET
EX 36
X 37
P3 10
P2 9
P1 8
P0 7
O7 6
O6 5
O5 4
O4 3
O3 2
O2 1
O1 48
O0 47
SO 46

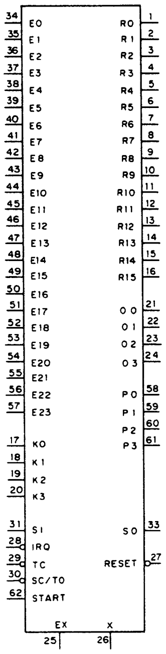
EX , EXTERNAL CLOCK IN
$\overline{\text{IRQ}}$, INTERRUPT REQUEST IN
K0-K3 , 4-BIT PARALLEL IN
O0-O7 , 4-BIT PARALLEL OUT
P0-P3 , 4-BIT PARALLEL OUT
R0-R14 , DATA IN/OUT
$\overline{\text{RESET}}$, RESET IN
$\overline{\text{SC}}/\overline{\text{TO}}$, SHIFT CLOCK IN/INT TIMING OUT
SI , SERIAL DATA IN
SO , SERIAL DATA OUT
START , STANDBY OFF IN
$\overline{\text{TC}}$, EXTERNAL CLOCK IN FOR COUNTER
X , CLOCK OUT


EX
X
OSC
SC (X1/6)
CONTROL
COMMAND DECODER
COMMAND TIMING
STACK (12X8)
PROGRAM COUNTER
MPX
ROM (4096 X 8)
VDD
GND
RESET
PRESCALER TIMER
PRESCALER SERIAL PORT
PRESCALER TIME COUNTER
CONSTANT ADDRESS
OUTPUT MPX
OUTPUT MPX
OUTPUT MPX
PORT DECODER
MPX
RAM (256 X 4)
STANDBY CONTROL
START
EXT INTERRUPT INPUT FLAG
INTERRUPT ROUTINE F/F
SBF/E INT. MASK
SBF/E INT.
SBF/E FLAG
OV INTERRUPT
OV INT. MASK
OV FLAG
EXT. INTERRUPT
EXT. INT. MASK
EXT. INT. FLAG
TIME INT. MASK
TIME INT. FLAG
CONSTANT GENERATOR
STACK
K
K3
K2
K1
K0
SHIFT BIT COUNTER (X1/4, X1/8)
SB (4/8)
TBH (4)
TH (4)
TBL (4)
TL (4)
X (4)
Y (4)
AC (4)
ALU (4)
ST
ZF
CF
TIMER COUNTER PSR
SERIAL PORT PSR
TIMER PSR
P
P3
P2
P1
P0
C
SC/TO SI SO TC IRQ
R3
R2
R1
R0
OH
OL
R14 R13 R12
R11 R10 R9 R8
R7 R6 R5 R4
R3 R2 R1 R0
O7 O6 O5 O4
O3 O2 O1 O0

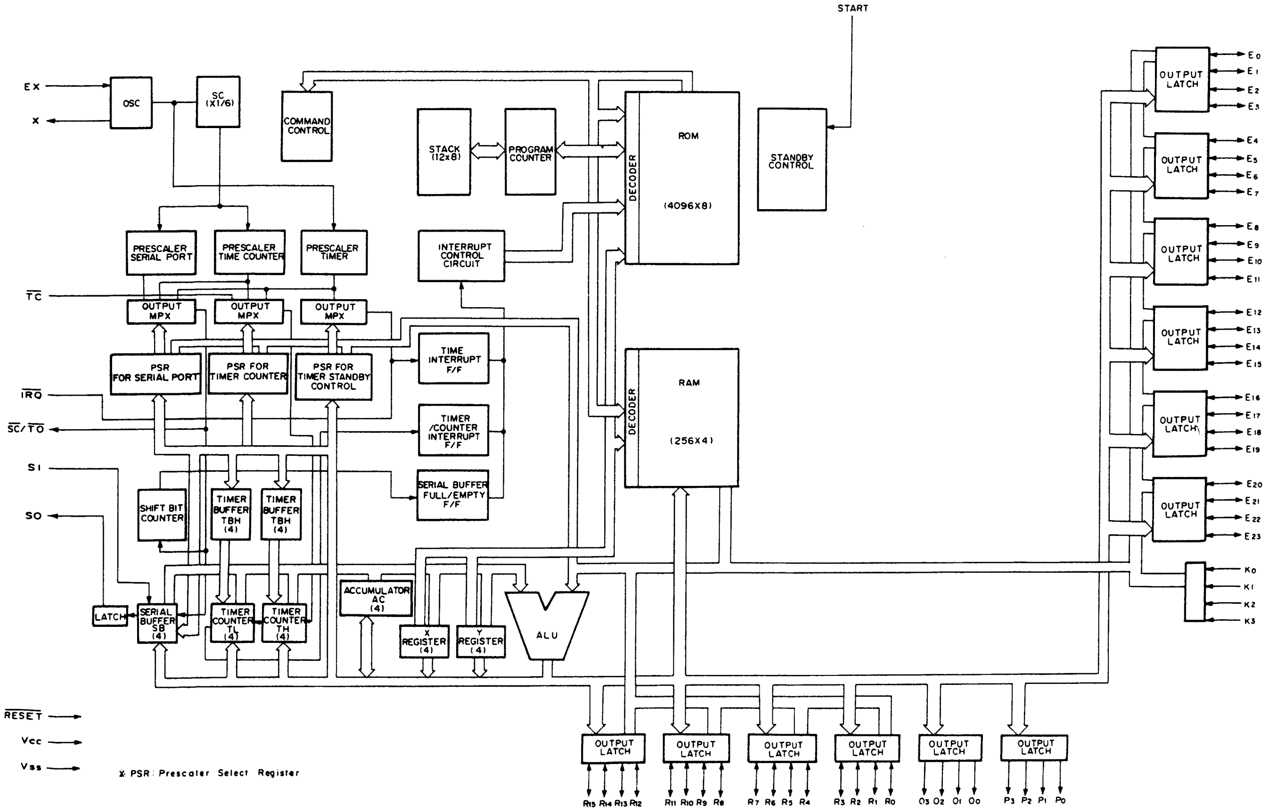
MB88521P (FUJITSU)
C-MOS 4-BIT ONE-CHIP MICROCOMPUTER
— TOP VIEW —


1
5
10
15
20
25
30
32
VDD (+5V)
NC
GND
64
60
55
50
45
40
35
33

PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL
1	○	○	R0	33		○	SO
2	○	○	R1	34	○	○	E0
3	○	○	R2	35	○	○	E1
4	○	○	R3	36	○	○	E2
5	○	○	R4	37	○	○	E3
6	○	○	R5	38	○	○	E4
7	○	○	R6	39	○	○	E5
8	○	○	R7	40	○	○	E6
9	○	○	R8	41	○	○	E7
10	○	○	R9	42	○	○	E8
11	○	○	R10	43	○	○	E9
12	○	○	R11	44	○	○	E10
13	○	○	R12	45	○	○	E11
14	○	○	R13	46	○	○	E12
15	○	○	R14	47	○	○	E13
16	○	○	R15	48	○	○	E14
17	○		K0	49	○	○	E15
18	○		K1	50	○	○	E16
19	○		K2	51	○	○	E17
20	○		K3	52	○	○	E18
21		○	00	53	○	○	E19
22		○	01	54	○	○	E20
23		○	02	55	○	○	E21
24		○	03	56	○	○	E22
25	○		EX	57	○	○	E23
26		○	X	58		○	P0
27	○	○	$\overline{RESET}$	59		○	P1
28	○		$\overline{IRQ}$	60		○	P2
29	○		$\overline{TC}$	61		○	P3
30	○	○	$\overline{SC}/\overline{TO}$	62	○		START
31	○		SI	63	—	—	———
32			GND	64			VDD

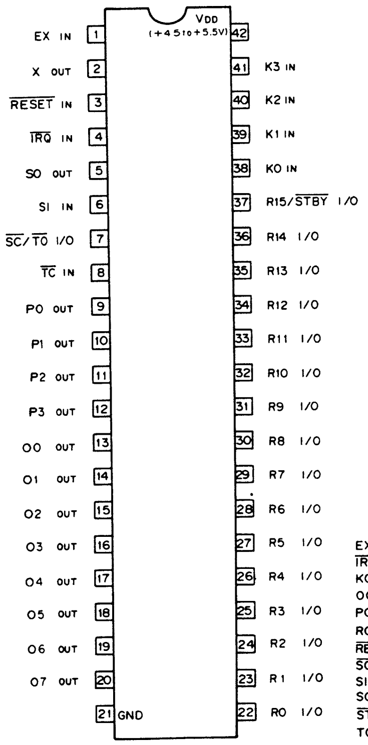

34 E0
35 E1
36 E2
37 E3
38 E4
39 E5
40 E6
41 E7
42 E8
43 E9
44 E10
45 E11
46 E12
47 E13
48 E14
49 E15
50 E16
51 E17
52 E18
53 E19
54 E20
55 E21
56 E22
57 E23
17 K0
18 K1
19 K2
20 K3
31 SI
28 IRQ
29 TC
30 SC/TO
62 START
R0 1
R1 2
R2 3
R3 4
R4 5
R5 6
R6 7
R7 8
R8 9
R9 10
R10 11
R11 12
R12 13
R13 14
R14 15
R15 16
O0 21
O1 22
O2 23
O3 24
P0 58
P1 59
P2 60
P3 61
SO 33
RESET 27
EX 25
X 26

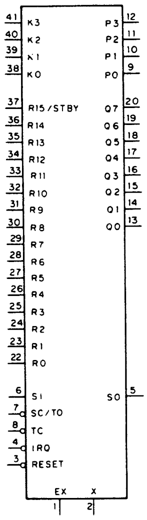
E0-E23 ; I/O PORT (E) IN/OUT
EX ; EXTERNAL CLOCK IN
$\overline{IRQ}$; EXTERNAL INTERRUPT REQUEST IN
K0-K3 ; INPUT PORT (K) IN
00-03 ; OUTPUT PORT (0) OUT
P0-P3 ; OUTPUT PORT (P) OUT
R0-R15 ; I/O PORT (R) IN/OUT
$\overline{RESET}$; RESET IN
$\overline{SC}/\overline{TO}$; SHIFT CLOCK IN/TIMING OUT
SI ; SERIAL DATA IN
START ; STANDBY RELEASE IN
SO ; SERAL DATA OUT
$\overline{TC}$; EXTERNAL CLOCK IN
X ; CLOCK OUT


START
EX
X
OSC
SC (X1/6)
COMMAND CONTROL
STACK (12x8)
PROGRAM COUNTER
DECODER
ROM (4096X8)
STANDBY CONTROL
PRESCALER SERIAL PORT
PRESCALER TIME COUNTER
PRESCALER TIMER
INTERRUPT CONTROL CIRCUIT
TC
OUTPUT MPX
OUTPUT MPX
OUTPUT MPX
PSR FOR SERIAL PORT
PSR FOR TIMER COUNTER
PSR FOR TIMER STANDBY CONTROL
TIME INTERRUPT F/F
IRQ
SC/TO
TIMER /COUNTER INTERRUPT F/F
DECODER
RAM (256X4)
SI
SO
SHIFT BIT COUNTER
TIMER BUFFER TBH (4)
TIMER BUFFER TBH (4)
SERIAL BUFFER FULL/EMPTY F/F
LATCH
SERIAL BUFFER SB (4)
TIMER COUNTER TL (4)
TIMER COUNTER TH (4)
ACCUMULATOR AC (4)
X REGISTER (4)
Y REGISTER (4)
ALU
OUTPUT LATCH
E0
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
E12
E13
E14
E15
E16
E17
E18
E19
E20
E21
E22
E23
K0
K1
K2
K3
RESET
Vcc
Vss
R15 R14 R13 R12
R11 R10 R9 R8
R7 R6 R5 R4
R3 R2 R1 R0
O3 O2 O1 O0
P3 P2 P1 P0

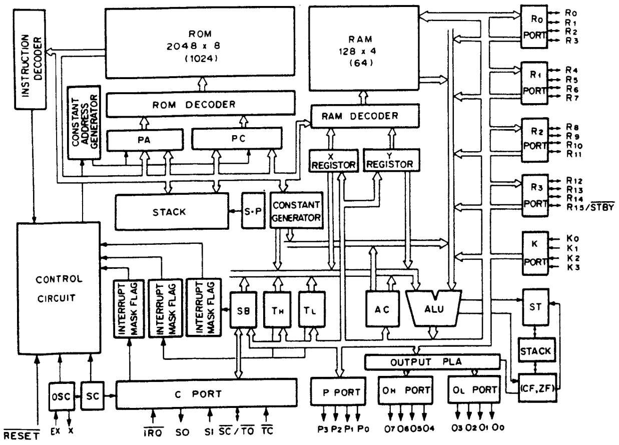
※ PSR : Prescaler Select Register

MB8851H (FUJITSU)
C-MOS 4-BIT ONE-CHIP MICROCOMPUTER
— TOP VIEW —

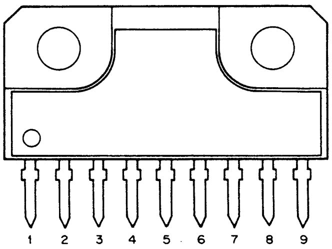

VDD (+4.5 to +5.5V) 42
EX IN 1
X OUT 2
RESET IN 3
IRQ IN 4
SO OUT 5
SI IN 6
SC/TO I/O 7
TC IN 8
PO OUT 9
P1 OUT 10
P2 OUT 11
P3 OUT 12
OO OUT 13
O1 OUT 14
O2 OUT 15
O3 OUT 16
O4 OUT 17
O5 OUT 18
O6 OUT 19
O7 OUT 20
21 GND
41 K3 IN
40 K2 IN
39 K1 IN
38 KO IN
37 R15/STBY I/O
36 R14 I/O
35 R13 I/O
34 R12 I/O
33 R11 I/O
32 R10 I/O
31 R9 I/O
30 R8 I/O
29 R7 I/O
28 R6 I/O
27 R5 I/O
26 R4 I/O
25 R3 I/O
24 R2 I/O
23 R1 I/O
22 RO I/O

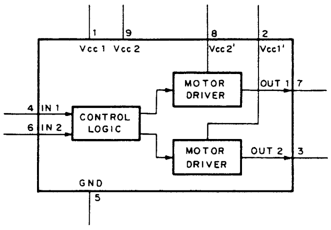

41 K3
40 K2
39 K1
38 KO
37 R15/STBY
36 R14
35 R13
34 R12
33 R11
32 R10
31 R9
30 R8
29 R7
28 R6
27 R5
26 R4
25 R3
24 R2
23 R1
22 RO
6 SI
7 SC/TO
8 TC
4 IRQ
3 RESET
EX 1
X 2
P3 12
P2 11
P1 10
PO 9
O7 20
O6 19
O5 18
O4 17
O3 16
O2 15
O1 14
OO 13
SO 5

EX ; EXTERNAL CLOCK IN
IRQ ; INTERRUPT IN
KO-K3 ; 4-BIT PARALLEL IN
OO-O7 ; PARALLEL OUT/8-BIT PLA OUT
PO-P3 ; 4-BIT PARALLEL OUT
RO-R15 ; DATA I/O
RESET ; RESET IN
SC/TO ; SHIFT CLOCK IN/INT TIMING OUT
SI ; SERIAL DATA IN
SO ; SERIAL DATA OUT
STBY ; STAND-BY IN
TC ; TIMER COUNTER
X ; CLOCK OUT


INSTRUCTION DECODER
ROM 2048 x 8 (1024)
CONSTANT ADDRESS GENERATOR
ROM DECODER
PA
PC
RAM 128 x 4 (64)
RAM DECODER
X REGISTOR
Y REGISTOR
STACK
S-P
CONSTANT GENERATOR
CONTROL CIRCUIT
INTERRUPT MASK FLAG
INTERRUPT MASK FLAG
INTERRUPT MASK FLAG
SB
TH
TL
AC
ALU
ST
STACK
OUTPUT PLA
(CF,ZF)
OSC
SC
C PORT
P PORT
OH PORT
OL PORT
Ro PORT
R1 PORT
R2 PORT
R3 PORT
K PORT
Ro R1 R2 R3
R4 R5 R6 R7
R8 R9 R10 R11
R12 R13 R14 R15/STBY
Ko K1 K2 K3
RESET EX X
IRQ SO SI SC/TO TC
P3 P2 P1 Po
O7 O6 O5 O4
O3 O2 O1 Oo

M54543L (MITSUBISHI)
BI-DIRECTIONAL MOTOR DRIVER
— SIDE VIEW —

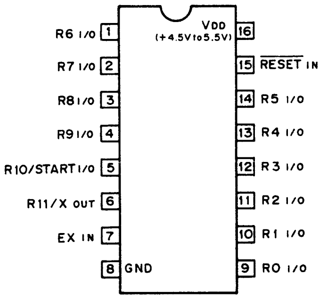


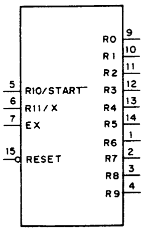

1
9
8
2
Vcc 1
Vcc 2
Vcc2'
Vcc1'
MOTOR DRIVER
OUT 1
7
4
IN 1
6
IN 2
CONTROL LOGIC
MOTOR DRIVER
OUT 2
3
GND
5

IN		OUT		MODE
1	2	1	2	
0	0	Z	Z	NO OPERATION
1	0	1	0	ROTATION
0	1	0	1	REVERSE ROTATION
1	1	0	0	BRAKE

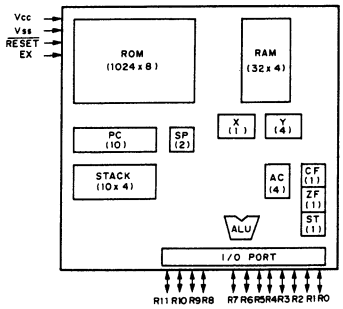
0 : LOW LEVEL
1 : HIGH LEVEL
Z : HIGH IMPEDANCE

MB88201-173N (FUJITSU)
C-MOS 4 BIT MICROCOMPUTER
— TOP VIEW —

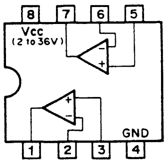

VDD (+4.5V to 5.5V) 16
R6 I/O 1
R7 I/O 2
R8 I/O 3
R9 I/O 4
R10/START I/O 5
R11/X OUT 6
EX IN 7
8 GND
15 RESET IN
14 R5 I/O
13 R4 I/O
12 R3 I/O
11 R2 I/O
10 R1 I/O
9 RO I/O


5 R10/START
6 R11/X
7 EX
15 RESET
RO 9
R1 10
R2 11
R3 12
R4 13
R5 14
R6 1
R7 2
R8 3
R9 4

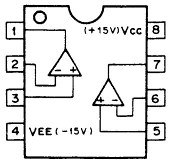
EX ; EXTERNAL X'TAL IN
RO-R11 ; I/O PORT(R) IN/OUT
RESET ; RESET IN
START ; STANDBY RELEASE IN
R11/X ; EXT CLOCK IN/INT CLOCK OUT


Vcc
Vss
RESET
EX
ROM (1024x8)
RAM (32x4)
X (1)
Y (4)
PC (10)
SP (2)
STACK (10x4)
AC (4)
CF (1)
ZF (1)
ST (1)
ALU
I/O PORT
R11 R10 R9 R8 R7 R6 R5 R4 R3 R2 R1 RO

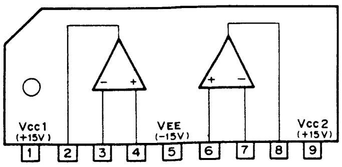
NJM2903D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —


8
7
6
5
Vcc
(2 to 36V)
GND
1
2
3
4

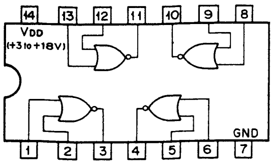
NJM4558D (JRC)
uPC4558C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —

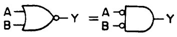

1
2
3
4
(+15V)Vcc
VEE (-15V)
8
7
6
5

NJM4558S (JRC)
HIGH PERFORMANCE DUAL OPERATIONAL AMPLIFIER
— SIDE VIEW —


Vcc1
(+15V)
VEE
(-15V)
Vcc2
(+15V)
1
2
3
4
5
6
7
8
9

TC4001 BP (TOSHIBA)
TC4001 UBP (TOSHIBA)
C-MOS 2-INPUT NOR GATE
— TOP VIEW —


14
13
12
11
10
9
8
VDD
(+3 to +18V)
GND
1
2
3
4
5
6
7

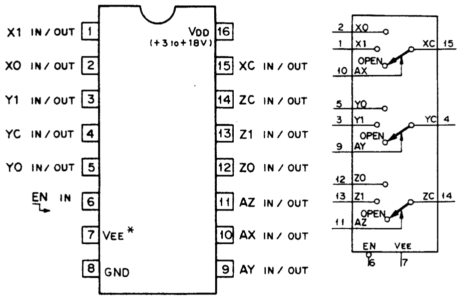


$Y = \overline{A+B} = \overline{A} \cdot \overline{B}$

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

HD14053BP (HITACHI)
TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

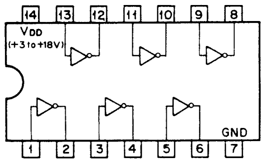

X1 IN/OUT 1
XO IN/OUT 2
Y1 IN/OUT 3
YC IN/OUT 4
YO IN/OUT 5
EN IN 6
7 VEE*
8 GND
VDD (+3 to +18V) 16
15 XC IN/OUT
14 ZC IN/OUT
13 Z1 IN/OUT
12 ZO IN/OUT
11 AZ IN/OUT
10 AX IN/OUT
9 AY IN/OUT
2 XO
1 X1
10 AX
OPEN
XC 15
5 YO
3 Y1
9 AY
OPEN
YC 4
12 ZO
13 Z1
11 AZ
OPEN
ZC 14
EN
VEE
6
7

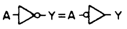
VEE*; VDD − VEE: +3 to +18 V

CONT. INPUTS		ON CHANNEL
EN	A (X,Y,Z,)	
0	0	0
0	1	1
1	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

HD14069BP (HITACHI)
MB84069UB (FUJITSU)
TC4069UBP (TOSHIBA)
uPD4069UBC (NEC)
C-MOS INVERTER
— TOP VIEW —


14
13
12
11
10
9
8
VDD
(+3 to +18V)
GND
1
2
3
4
5
6
7

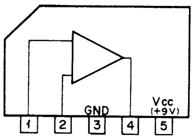


$Y = \overline{A}$

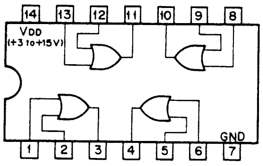
A	Y
0	1
1	0

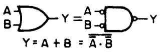
0; LOW LEVEL
1; HIGH LEVEL

TA7060AP (TOSHIBA)
TA7060P (TOSHIBA)
LINEAR AMP
— SIDE VIEW —


GND
Vcc
(+9V)
1
2
3
4
5

MC14071BCP (MOTOROLA)
TC4071BP (TOSHIBA)
C-MOS 2-INPUT OR GATE
— TOP VIEW —


14
13
12
11
10
9
8
VDD
(+3 to +15V)
GND
1
2
3
4
5
6
7

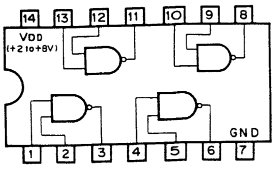


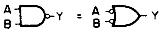
$Y = A + B = \overline{\overline{A} \cdot \overline{B}}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0; LOW LEVEL
1; HIGH LEVEL

TC40H000P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —


14
13
12
11
10
9
8
VDD
(+2 to+8V)
GND
1
2
3
4
5
6
7

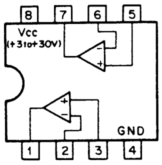


$Y = \overline{A \cdot B} = \bar{A} + \bar{B}$

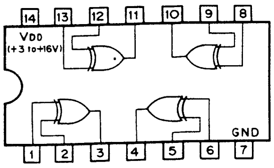
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

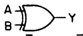
0; LOW LEVEL
1; HIGH LEVEL

uPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —


8
7
6
5
Vcc
(+3 to+30V)
GND
1
2
3
4

TC4030BP (TOSHIBA)
C-MOS EXCLUSIVE OR GATE
— TOP VIEW —


14
13
12
11
10
9
8
VDD
(+3 to+16V)
GND
1
2
3
4
5
6
7

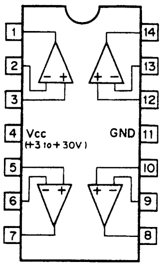


$Y = \bar{A} \cdot B + A \cdot \bar{B}$

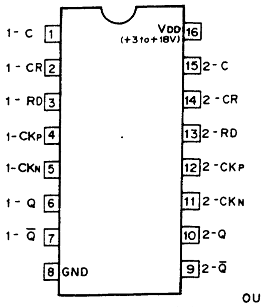
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

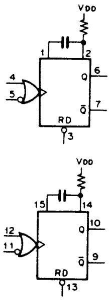
0:LOW LEVEL
1:HIGH LEVEL

uPC324C (NEC)
QUAD. OP AMPLIFIER
— TOP VIEW —


1
2
3
4
Vcc
(+3 to+30V)
GND
5
6
7
14
13
12
11
10
9
8

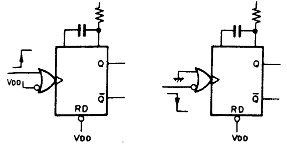
HD14538BP (HITACHI)
MC14538BCP (MOTOROLA)
TC4538BP (TOSHIBA)
C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE
MONOSTABLE MULTIVIBRATOR
— TOP VIEW —


1- C
1- CR
1- RD
1-CKP
1-CKN
1- Q
1- Q̄
GND
VDD
(+3 to+18V)
2- C
2 -CR
2 -RD
2 -CKP
2 -CKN
2-Q
2-Q̄
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9

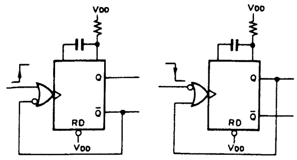

VDD
1
2
4
5
6
7
Q
Q̄
RD
3
VDD
15
14
12
11
10
9
Q
Q̄
RD
13

OUTPUT PULSE WIDTH=CR

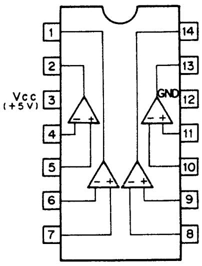
RETRIGGERABLE M.M.V


VDD
VDD
Q
Q̄
RD
VDD
VDD
Q
Q̄
RD
VDD

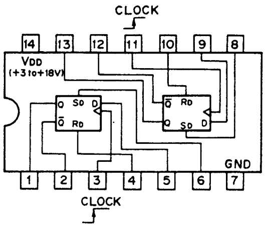
NON-RETRIGGERABLE M.M.V


VDD
VDD
Q
Q̄
RD
VDD
Q
Q̄
RD
VDD

uPC339C (NEC)
COMPARATOR
— TOP VIEW —


1
2
Vcc
(+5V)
3
4
5
6
7
14
13
GND
12
11
10
9
8

TC504013BP (TOSHIBA)
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
— TOP VIEW —


CLOCK
14
13
12
11
10
9
8
VDD
(+3 to+18V)
Q
SD
D
Q̄
RD
Q̄
RD
Q
SD
D
GND
1
2
3
4
5
6
7
CLOCK

DIRECT R-S FLIP FLOP

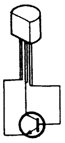
SD	RD	Q	$\bar{Q}$
0	0	Qn	$\bar{Q}$n
0	1	0	1
1	0	1	0
1	1	0	1

D-TYPE FLIP FLOP

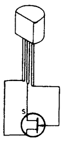
CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK; ⎍
CKn; BEFORE CLOCK
CKn+1; AFTER CLOCK
0; LOW LEVEL
1; HIGH LEVEL

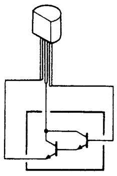
TRANSISTOR



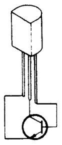
2SC1740
2SC2878
2SC3068



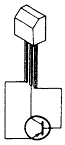
2SK152
2SK523



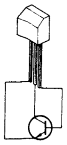
2SD1111



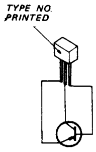
2SD789



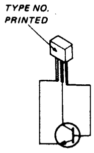
2SB733



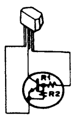
2SD774


TYPE NO.
PRINTED

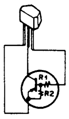
2SA1175
2SA1175F


TYPE NO.
PRINTED

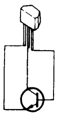
2SC2785E
2SC2785F
2SC2785K



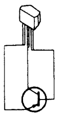
DTC124XS (R1=22K, R2=47K)
DTC144ES (R1=47K, R2=47K)



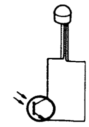
DTA124XS (R1=22K, R2=47K)



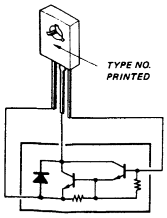
2SC1740S
2SC2458
2SC2603
2SC2603G
2SC403SP



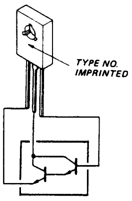
2SA1048
2SA1115
2SA933S



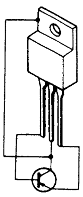
SPS102


TYPE NO.
PRINTED

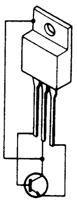
2SD998


TYPE NO.
IMPRINTED

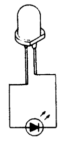
2SD894



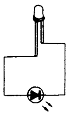
2SA768
2SA771



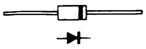
2SC1826
2SD880



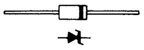
EAA5504S ; AMBER
EBG5504S ; GREEN
GL-5HD5 ; RED



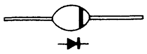
BR5104S ; RED



10E-2
11E2
1SS119
1SS133
1SS148
ERB12-? ?
SIB01-02

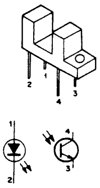


RD ? ?EB



U05E
U05G

PS4005



等価回路は IC メーカーの Data Book に従いました。

The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

SECTION 14
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

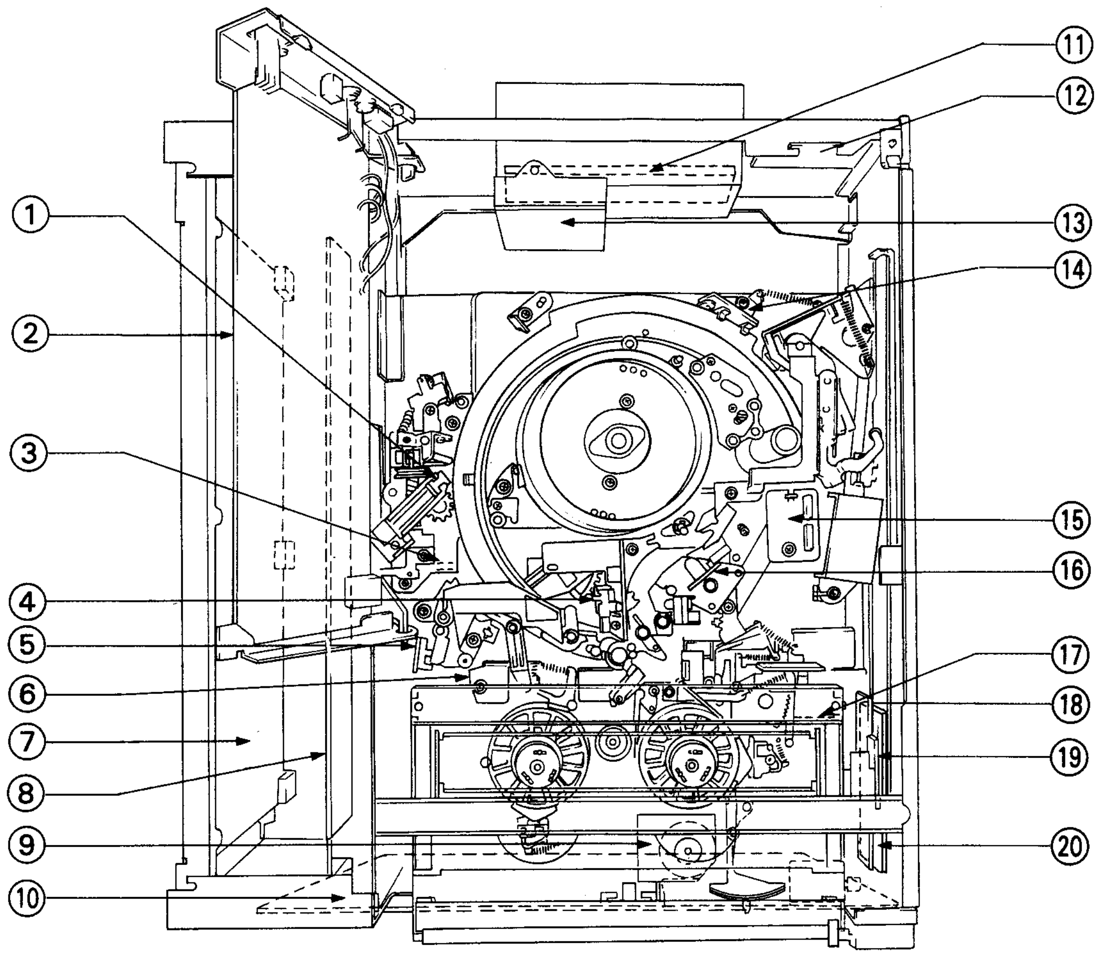
CIRCUIT FUNCTION OF PRINTED CIRCUIT BOARD

The circuit imformation is provided below.

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	VA-35	Video Demodulator
AUDIO	AH-11	Audio PB Head
	VA-35	Audio PB Amplifier
SERVO	AH-11	CTL PB Head
	EC-23	FR CTL PB Head
	PT-9	Reel Motor Driver
	SV-74	Drum / Capstan Servo
POWER	AC-65	AC Input
	DC-24	DC Supply / Fuse
	UR-14	Switching Regulator
KEY	KY-91	Function Key / Display
SYSTEM CONTROL	PD-29	Pinch,S-idler,S-brake, Search,Skew Solenoid
	PD-30	T-idler,T-brake Solenoid
	PH-5	Tape Beginning / End Detector
	SY-51	System Control
OTHERS	CC-22	Cassette Compartment Switch / Motor
	CC-23	
	CC-24	
	LM-13	Threading Motor
	PTC-16	S-reel Rotation Detector
	PTC-17	Threading Ring Detector
	RM-39	Reel Motor
	SE-46	Tension Regulator
	PTC-16	T-reel Rotation Detector
	SW-50	FR Unthread End Detector
	TG-22	Tension Regulator LED

LOCATION OF THE PRINTED CIRCUIT BOARD

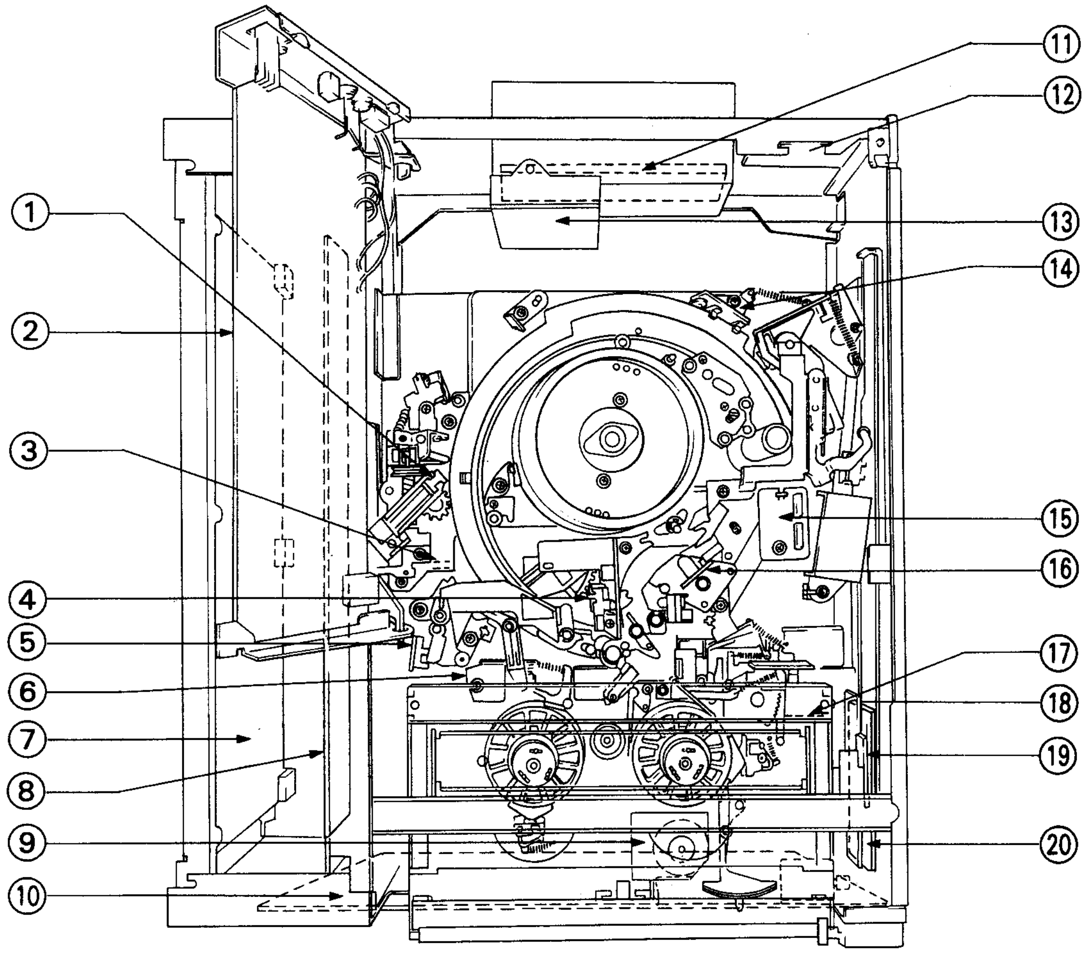
(TOP VIEW)



1	PH-5 Board
2	VA-35 Board
3	LM-13 Board
4	PH-5 Board
5	SW-50 Board
6	SE-46 Board
7	SV-74 Board
8	SY-51 Board
9	RM-39 Board
10	KY-91 Board
11	UR-14
12	AC-65 Board
13	DC-24 Board
14	PTC-17 Board
15	AH-11 Board
16	EC-23 Board
17	CC-23 Board
18	CC-22 Board
19	CC-24 Board
20	PD-29 Board

LOCATION OF THE PRINTED CIRCUIT BOARD

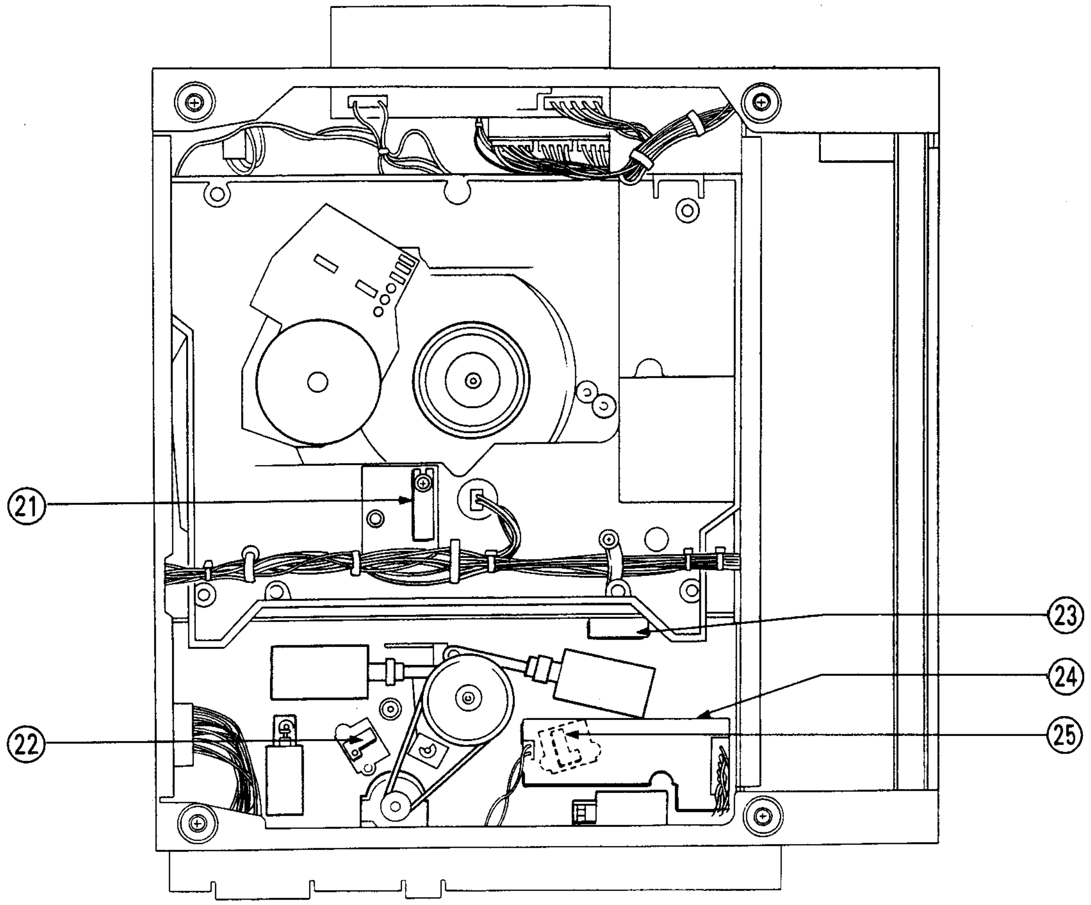
〈TOP VIEW〉



1 PH-5 Board
2 VA-35 Board
3 LM-13 Board
4 PH-5 Board
5 SW-50 Board
6 SE-46 Board
7 SV-74 Board
8 SY-51 Board
9 RM-39 Board
10 KY-91 Board

11 UR-14
12 AC-65 Board
13 DC-24 Board
14 PTC-17 Board
15 AH-11 Board
16 EC-23 Board
17 CC-23 Board
18 CC-22 Board
19 CC-24 Board
20 PD-29 Board

〈BOTTOM VIEW〉

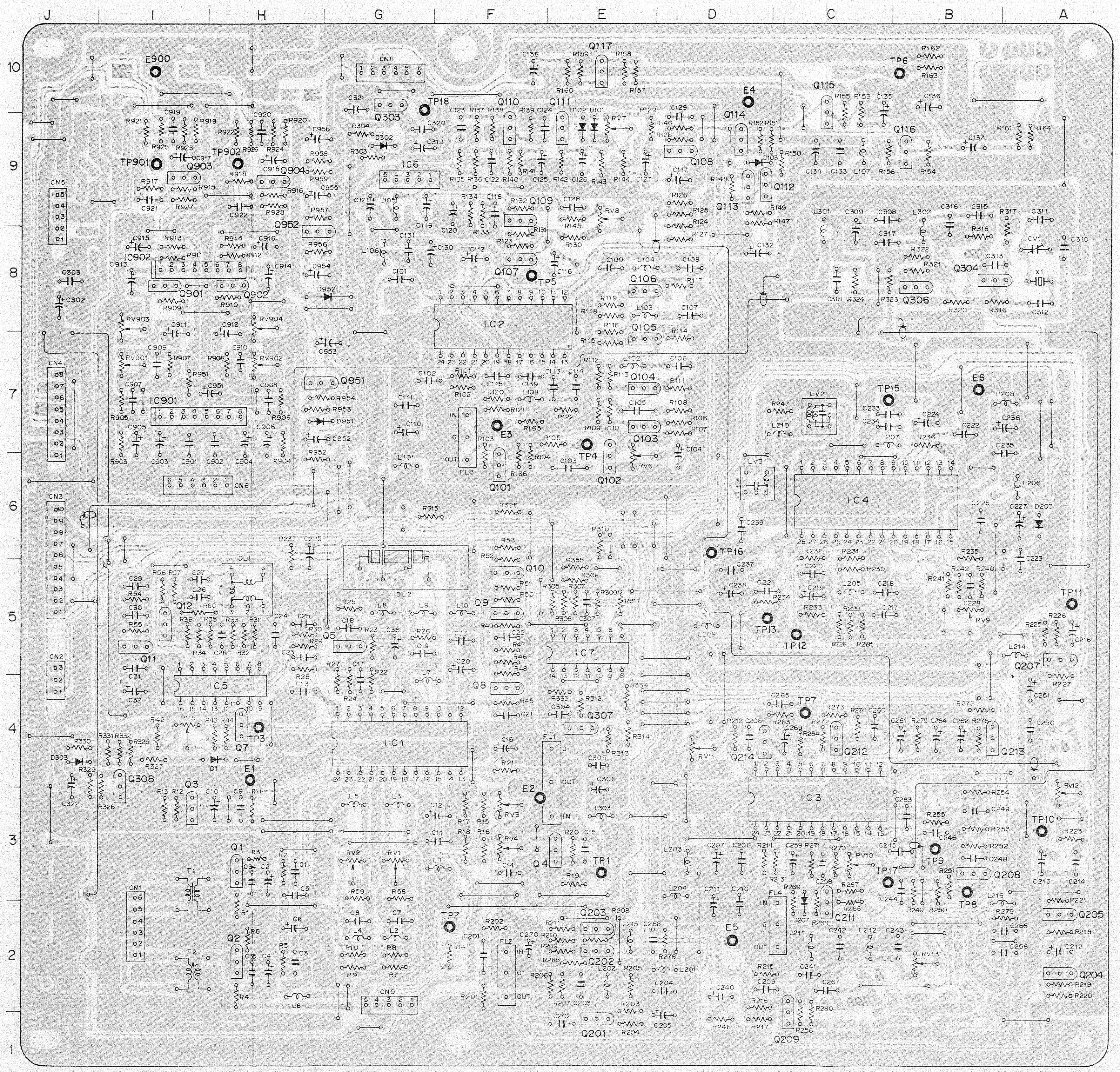


21 PT-9 Board
22 PTC-16 Board
23 TG-22 Board
24 PD-30 Board
25 PTC-16 Board

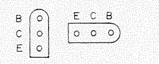
VA-35 ; VIDEO/AUDIO PB

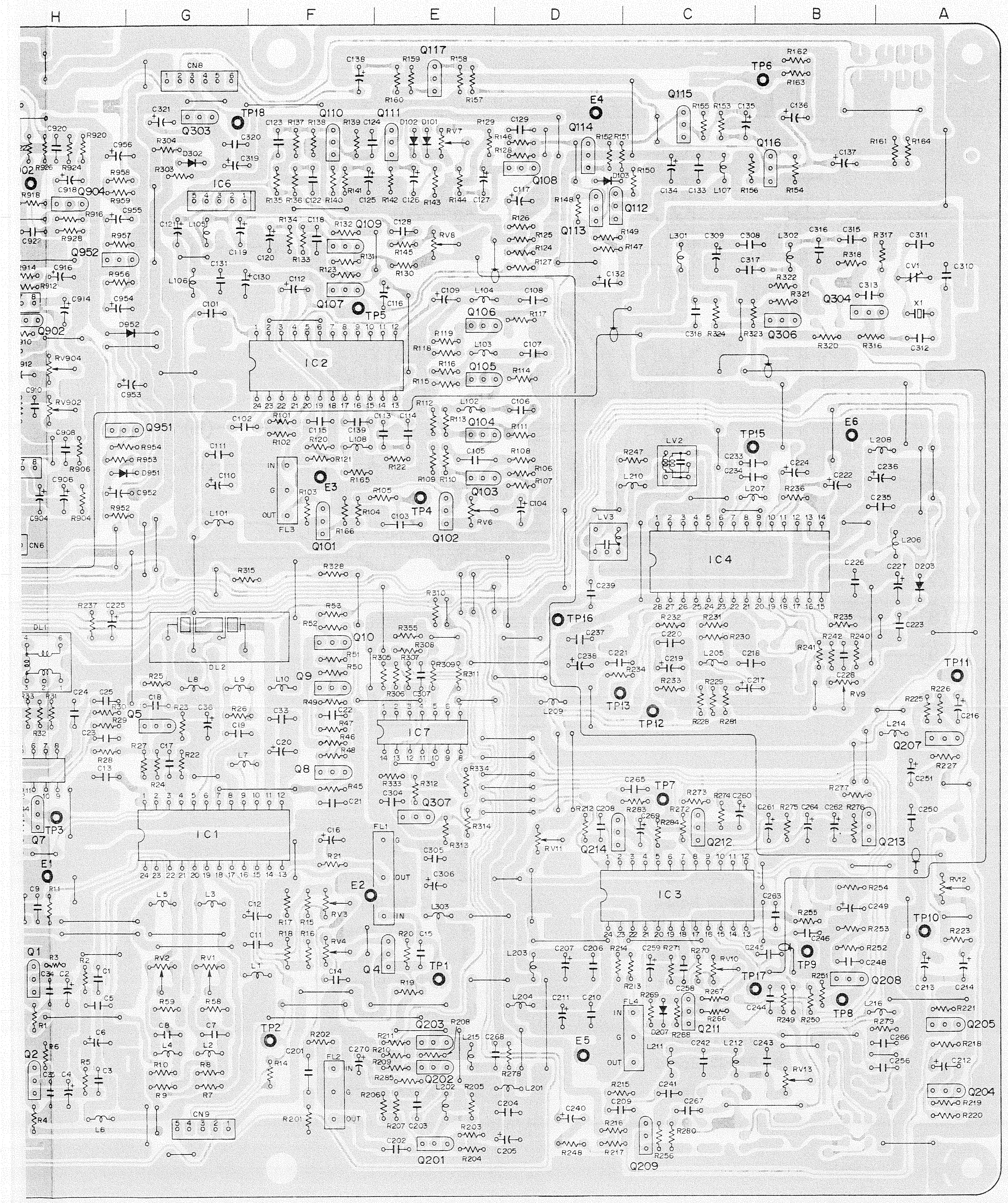
CN1	I - 2
CN2	J - 4
CN3	J - 5
CN4	J - 7
CN5	J - 8
CN6	I - 6
CN8	G - 10
CN9	G - 2
CV1	A - 8
D1	H - 4
D101	E - 9
D102	E - 9
D103	D - 9
D203	A - 6
D207	C - 2
D302	G - 9
D303	J - 4
D951	G - 7
D952	G - 8
DL1	H - 5
DL2	G - 5
E1	H - 3
E2	F - 3
E3	F - 7
E4	D - 10
E5	D - 2
E6	B - 7
E900	I - 10
FL1	E - 3
FL2	F - 2
FL3	F - 7
FL4	C - 2
IC1	G - 4
IC2	F - 8
IC3	C - 3
IC4	C - 6
IC5	H - 4
IC6	G - 9
IC7	E - 5
IC901	I - 7
LV2	C - 7
LV3	D - 6
Q1	H - 3
Q2	H - 2
Q3	I - 3
Q4	E - 3
Q5	G - 5
Q7	H - 4
Q8	F - 4
Q9	F - 5
Q10	F - 5
Q11	I - 5
Q12	I - 5
Q101	F - 6
Q102	E - 6
Q103	E - 7
Q104	E - 7
Q105	E - 7
Q106	E - 8
Q107	F - 8
Q108	D - 9
Q109	F - 9
Q110	F - 9
Q111	E - 9
Q112	D - 9
Q113	D - 9
Q114	D - 9
Q115	C - 10
Q116	B - 9
Q117	E - 10
Q201	E - 1
Q202	E - 2
Q203	E - 2
Q204	A - 2
Q205	A - 2
Q207	A - 5
Q208	B - 3
Q209	C - 1
Q211	C - 2
Q212	C - 4
Q213	B - 4
Q214	D - 4
Q303	G - 10
Q304	B - 8
Q306	B - 8
Q307	E - 4
Q308	I - 3
Q901	I - 8
Q902	H - 8
Q903	I - 9
Q904	H - 9
Q951	H - 7
Q952	H - 8

RV1	G - 3
RV2	G - 3
RV3	F - 3
RV4	F - 3
RV5	I - 4
RV6	E - 6
RV7	E - 9
RV8	E - 9
RV9	B - 5
RV10	C - 3
RV11	D - 4
RV12	A - 4
RV13	B - 2
RV901	I - 7
RV902	H - 7
RV903	I - 8
RV904	H - 8
T1	I - 3
T2	I - 2
TP1	E - 3
TP2	F - 2
TP3	H - 4
TP4	E - 7
TP5	F - 8
TP6	B - 10
TP7	C - 4
TP8	B - 3
TP9	B - 3
TP10	A - 3
TP11	A - 5
TP12	C - 5
TP13	D - 5
TP15	C - 7
TP16	D - 6
TP17	B - 3
TP18	G - 10
TP901	I - 9
TP902	H - 9
X1	A - 8


J
I
H
G
F
E
D
C
B
A
10
9
8
7
6
5
4
3
2
1
E900
TP901
TP902
Q903
Q904
Q952
IC902
Q901
Q902
IC901
Q951
CN5
CN4
CN3
CN2
CN1
CN6
CN8
CN9
Q303
TP18
IC6
Q110
Q111
Q117
E4
Q114
Q115
Q116
TP6
Q108
Q112
Q113
Q109
Q107
TP5
Q106
IC2
Q105
Q104
E3
Q103
TP4
Q101
Q102
FL3
Q304
Q306
X1
CV1
TP15
E6
LV2
LV3
IC4
TP16
TP13
TP12
TP11
DL1
DL2
Q12
Q11
IC5
Q5
Q10
Q9
Q8
IC7
TP7
Q307
IC1
TP3
Q7
D1
E1
Q308
Q3
Q214
Q212
Q213
IC3
E2
FL1
Q207
TP10
Q1
T1
Q2
T2
Q4
TP1
TP17
TP9
Q208
TP8
Q205
Q203
TP2
Q202
FL2
E5
Q211
Q204
Q201
Q209

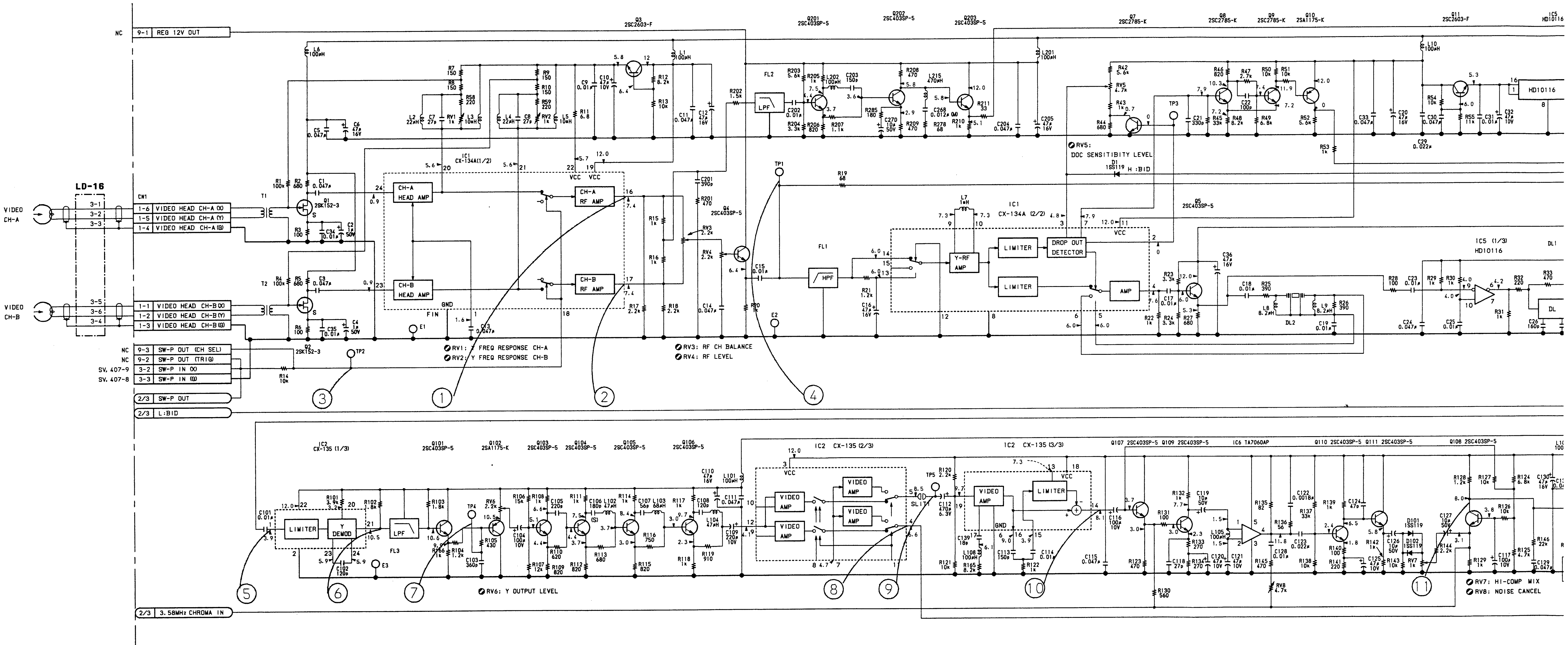
VA-35 -SOLDERING SIDE-
1-618-603-11
VP-5020

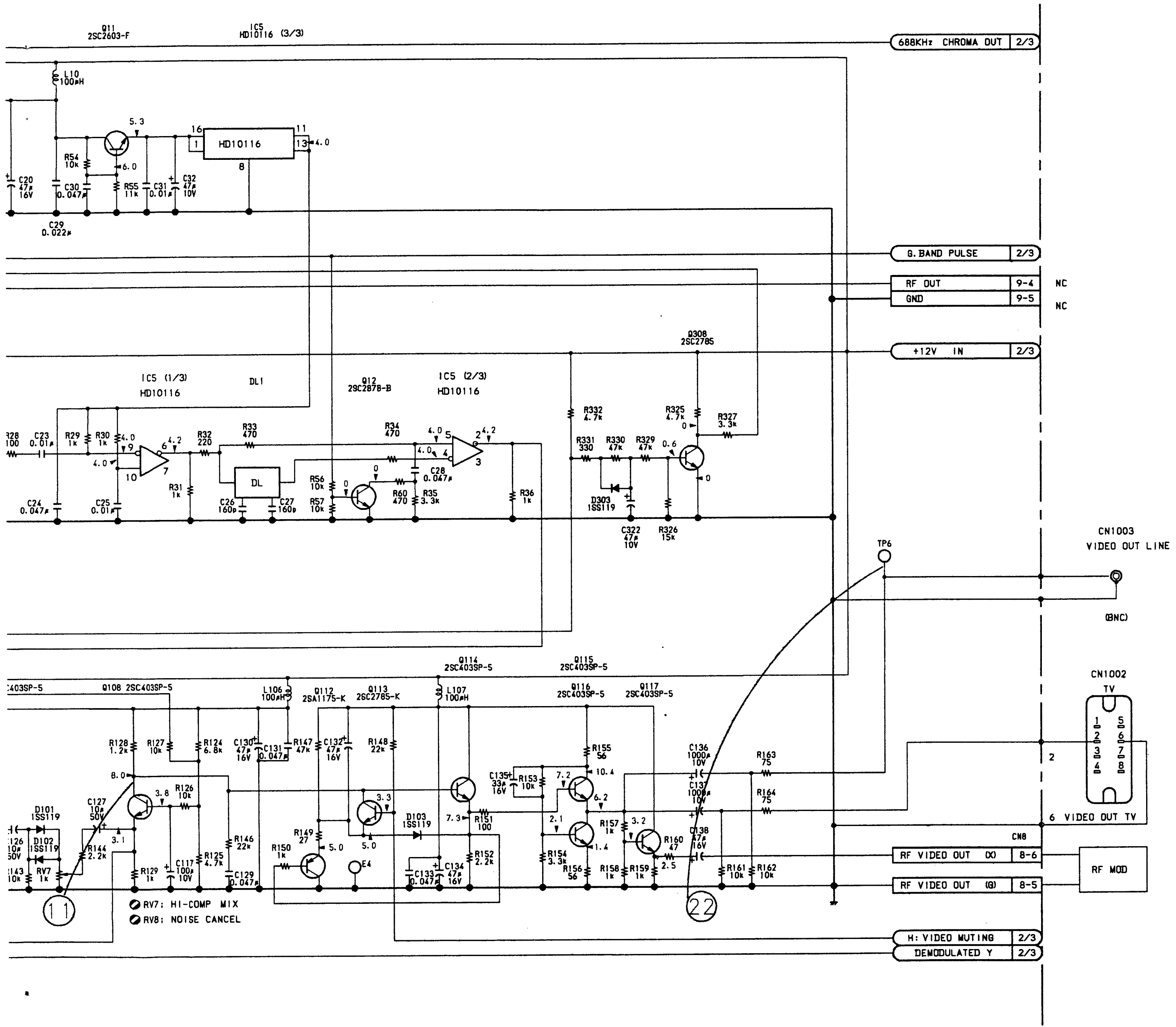



H
G
F
E
D
C
B
A
IC1
IC2
IC3
IC4
IC6
IC7
Q1
Q2
Q4
Q5
Q7
Q8
Q9
Q10
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q108
Q109
Q110
Q111
Q112
Q113
Q114
Q115
Q116
Q117
Q201
Q202
Q203
Q204
Q205
Q207
Q208
Q209
Q211
Q212
Q213
Q214
Q303
Q304
Q306
Q307
Q902
Q904
Q951
Q952
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP15
TP16
TP17
TP18
E1
E2
E3
E4
E5
E6
CN6
CN8
CN9
DL1
DL2
FL1
FL2
FL3
FL4
LV2
LV3
X1
CV1

VA-35–SOLDERING SIDE–
1-618-603-11
VP-5020

VA-35 (1/3) ; Y DEMODULATOR


LD-16
VIDEO CH-A
VIDEO CH-B
9-1 REG 12V OUT
1-6 VIDEO HEAD CH-A (X)
1-5 VIDEO HEAD CH-A (Y)
1-4 VIDEO HEAD CH-A (G)
1-1 VIDEO HEAD CH-B (X)
1-2 VIDEO HEAD CH-B (Y)
1-3 VIDEO HEAD CH-B (G)
9-3 SW-P OUT (CH SEL)
9-2 SW-P OUT (TRIG)
3-2 SW-P IN (X)
3-3 SW-P IN (G)
2/3 SW-P OUT
2/3 L:BID
2/3 3.58MHz CHROMA IN
IC1 CX-134A (1/2)
CH-A HEAD AMP
CH-B HEAD AMP
CH-A RF AMP
CH-B RF AMP
Q3 2SC2603-F
Q1 2SK152-3
Q2 2SK152-3
Q4 2SC403SP-5
Q201 2SC403SP-5
Q202 2SC403SP-5
Q203 2SC403SP-5
Q7 2SC2785-K
Q8 2SC2785-K
Q9 2SC2785-K
Q10 2SA1175-K
Q11 2SC2603-F
Q5 2SC403SP-5
IC5 HD10116
IC5 (1/3) HD10116
LPF
HPF
IC1 CX-134A (2/2)
Y-RF AMP
LIMITER
DROP OUT DETECTOR
AMP
TP1
TP2
TP3
E1
E2
ⓇRV1: Y FREQ RESPONSE CH-A
ⓇRV2: Y FREQ RESPONSE CH-B
ⓇRV3: RF CH BALANCE
ⓇRV4: RF LEVEL
ⓇRV5: DOC SENSITIBITY LEVEL
D1 1SS119 H:BID
IC2 CX-135 (1/3)
Q101 2SC403SP-5
Q102 2SA1175-K
Q103 2SC403SP-5
Q104 2SC403SP-5
Q105 2SC403SP-5
Q106 2SC403SP-5
LIMITER
Y DEMOD
LPF
FL3
TP4
E3
ⓇRV6: Y OUTPUT LEVEL
IC2 CX-135 (2/3)
VIDEO AMP
IC2 CX-135 (3/3)
TP5
SLIT
Q107 2SC403SP-5
Q109 2SC403SP-5
IC6 TA7060AP
Q110 2SC403SP-5
Q111 2SC403SP-5
Q108 2SC403SP-5
D101 1SS119
D102 1SS119
ⓇRV7: HI-COMP MIX
ⓇRV8: NOISE CANCEL
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪


Q11 2SC2603-F
IC5 HD10116 (3/3)
688KHz CHROMA OUT 2/3
L10 100μH
HD10116
R54 10k
C20 47μ 16V
C30 0.047μ
R55 11k
C31 0.01μ
C32 47μ 10V
C29 0.022μ
G. BAND PULSE 2/3
RF OUT 9-4
GND 9-5
NC
+12V IN 2/3
Q308 2SC2785
IC5 (1/3) HD10116
DL1
Q12 2SC2878-B
IC5 (2/3) HD10116
DL
R332 4.7k
R325 4.7k
R327 3.3k
R331 330
R330 47k
R329 47k
D303 1SS119
C322 47μ 10V
R326 15k
TP6
CN1003 VIDEO OUT LINE
(BNC)
CN1002 TV
6 VIDEO OUT TV
Q114 2SC403SP-5
Q115 2SC403SP-5
Q108 2SC403SP-5
L106 100μH
Q112 2SA1175-K
Q113 2SC2785-K
L107 100μH
Q116 2SC403SP-5
Q117 2SC403SP-5
D101 1SS119
D102 1SS119
D103 1SS119
E4
CN8
RF VIDEO OUT (D) 8-6
RF VIDEO OUT (G) 8-5
RF MOD
H: VIDEO MUTING 2/3
DEMODULATED Y 2/3
⑪
㉒
RV7: HI-COMP MIX
RV8: NOISE CANCEL

VA-35 (1/3)

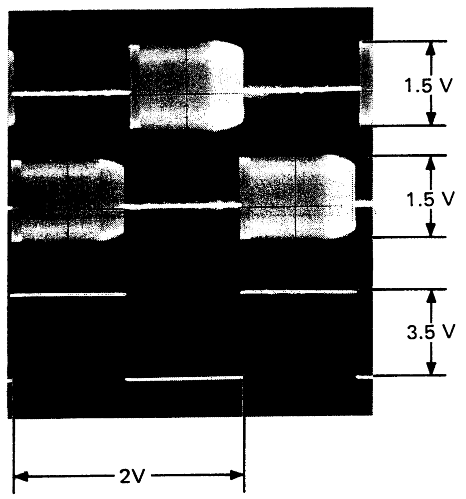
1-618-603-11

VP-5020

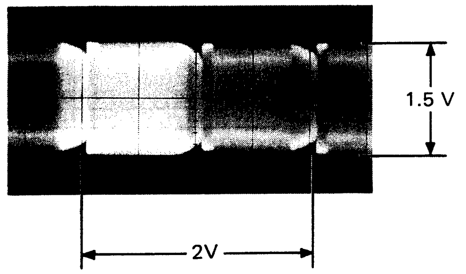
① IC1-16

② IC1-17

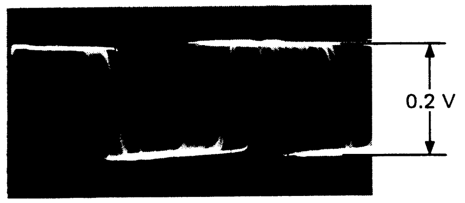
③ TP2



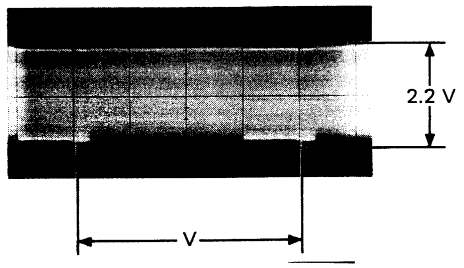
④ TP1



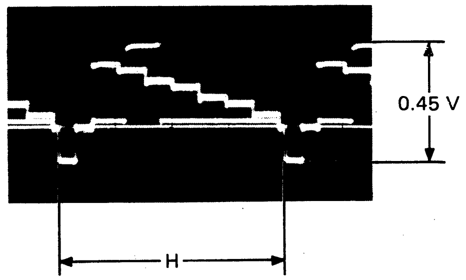
⑤ IC2-1



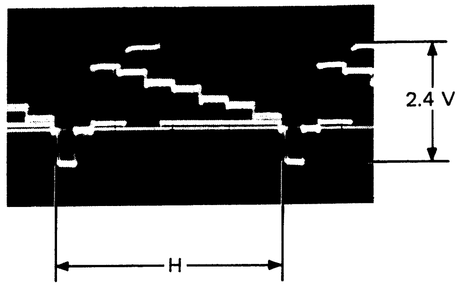
⑥ IC2-21



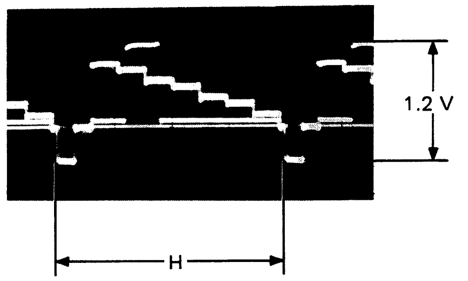
⑦ TP4



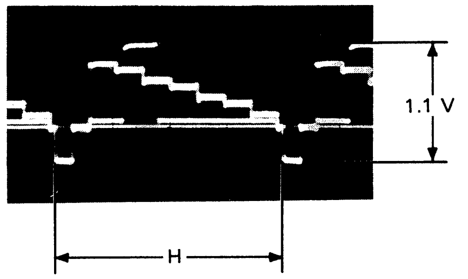
⑧ IC2-4



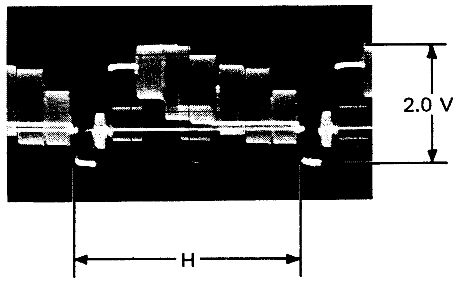
⑨ TP5



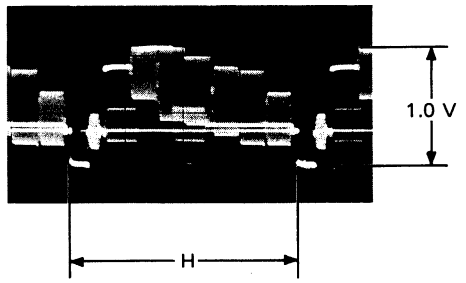
⑩ IC2-14



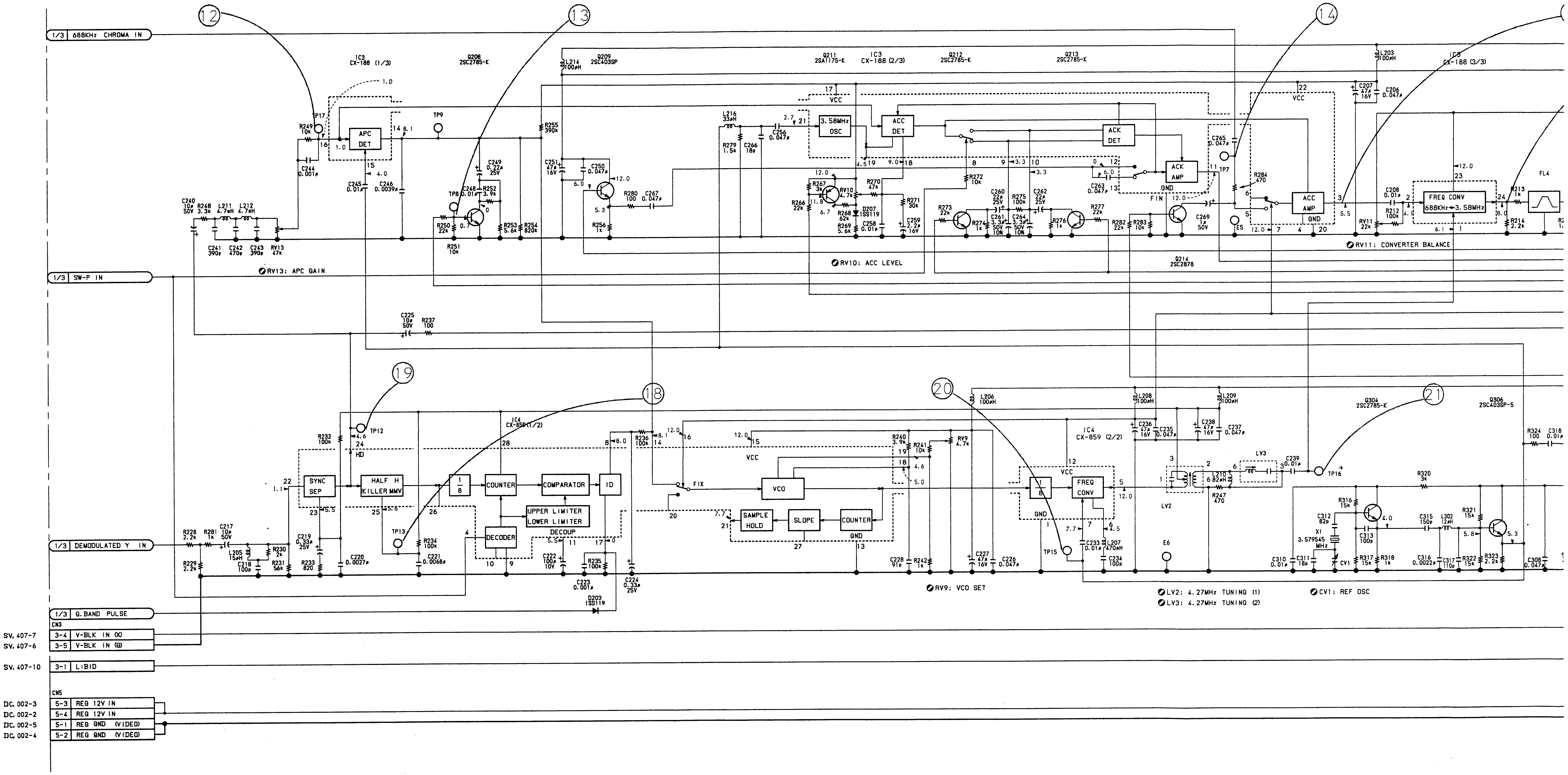
⑪ Q108-C

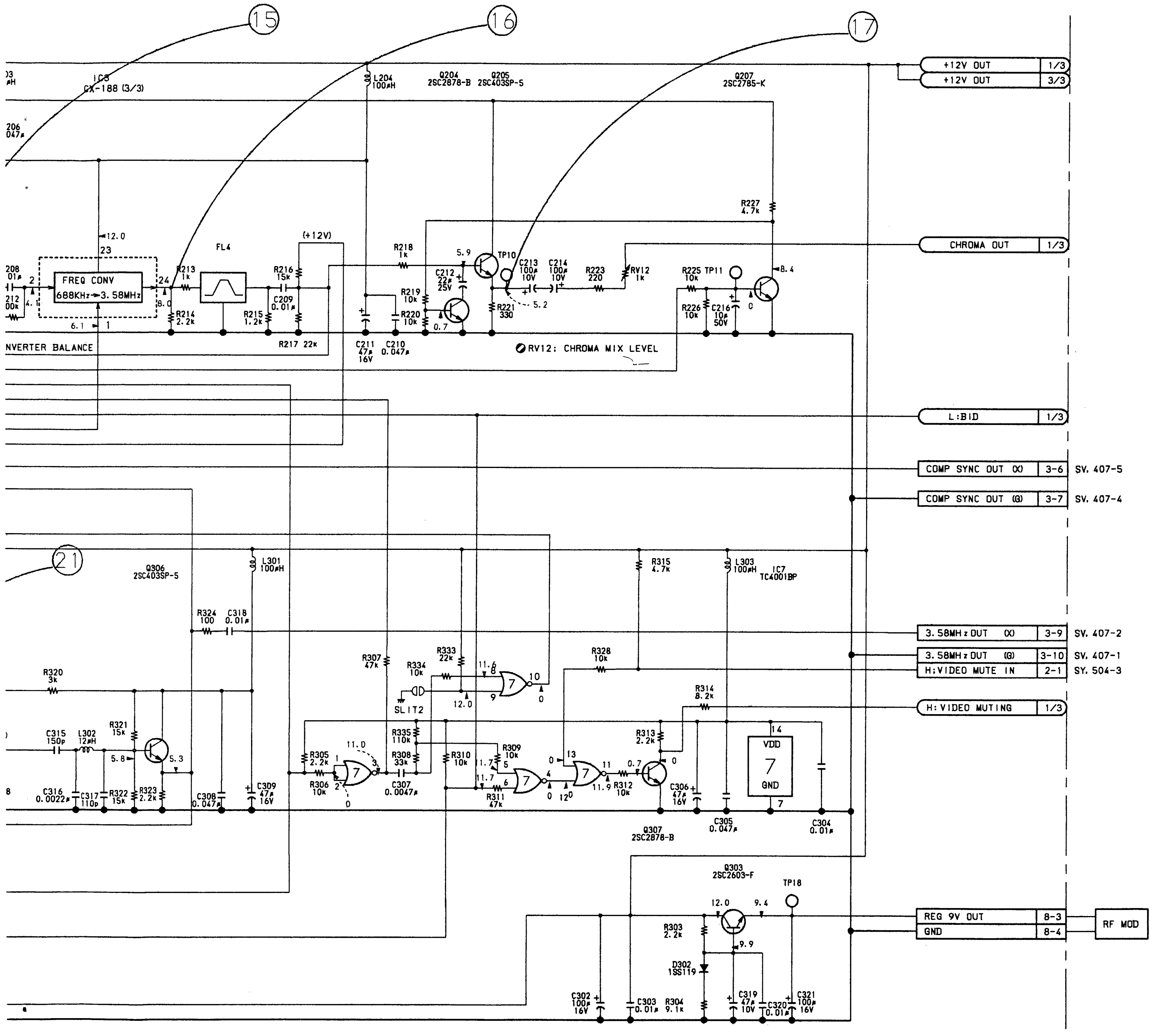


㉒ TP6



VA-35 (2/3) ; CHROMA DEMODULATOR

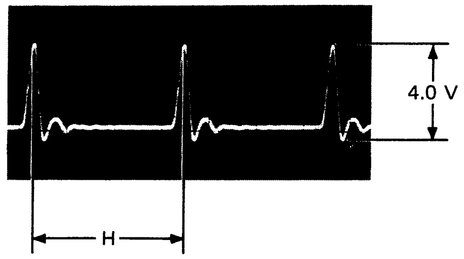

1/3 688KHz CHROMA IN
1/3 SW-P IN
1/3 DEMODULATED Y IN
1/3 G.BAND PULSE
CN3
SV.407-7 3-4 V-BLK IN (X)
SV.407-6 3-5 V-BLK IN (G)
SV.407-10 3-1 L:BID
CN5
DC.002-3 5-3 REG 12V IN
DC.002-2 5-4 REG 12V IN
DC.002-5 5-1 REG GND (VIDEO)
DC.002-4 5-2 REG GND (VIDEO)
IC3 CX-188 (1/3)
IC3 CX-188 (2/3)
IC3 CX-188 (3/3)
IC4 CX-859 (1/2)
IC4 CX-859 (2/2)
Q208 2SC2785-K
Q209 2SC403SP
Q211 2SA1175-K
Q212 2SC2785-K
Q213 2SC2785-K
Q214 2SC2878
Q304 2SC2785-K
Q306 2SC403SP-5
APC DET
3.58MHz OSC
ACC DET
ACK DET
ACK AMP
ACC AMP
FREQ CONV 688KHz→3.58MHz
FL4
SYNC SEP
HALF H KILLER MMV
1/8
COUNTER
COMPARATOR
ID
UPPER LIMITER
LOWER LIMITER
DECODER
DECOUP
FIX
VCO
SAMPLE HOLD
SLOPE
COUNTER
GND
VCC
FREQ CONV
LV2
LV3
X1 3.579545 MHz
CV1
TP7
TP8
TP9
TP12
TP13
TP15
TP16
TP17
E5
E6
RV13: APC GAIN
RV10: ACC LEVEL
RV11: CONVERTER BALANCE
RV9: VCO SET
LV2: 4.27MHz TUNING (1)
LV3: 4.27MHz TUNING (2)
CV1: REF OSC
D203 1SS119
D207 1SS119
⑫
⑬
⑭
⑱
⑲
⑳
㉑


⑮
⑯
⑰
㉑
IC3
CX-188 (3/3)
L204 100μH
Q204 2SC2878-B
Q205 2SC403SP-5
Q207 2SC2785-K
FREQ CONV
688KHz→3.58MHz
FL4
(+12V)
R213 1k
R214 2.2k
R215 1.2k
R216 15k
C209 0.01μ
R217 22k
R218 1k
R219 10k
R220 10k
C211 47μ 16V
C210 0.047μ
C212 22μ 25V
R221 330
TP10
C213 100μ 10V
C214 100μ 10V
R223 220
RV12 1k
R225 10k
TP11
R226 10k
C216 10μ 50V
R227 4.7k
RV12: CHROMA MIX LEVEL
INVERTER BALANCE
+12V OUT 1/3
+12V OUT 3/3
CHROMA OUT 1/3
L:BID 1/3
COMP SYNC OUT (X) 3-6 SV. 407-5
COMP SYNC OUT (G) 3-7 SV. 407-4
3.58MHz OUT (X) 3-9 SV. 407-2
3.58MHz OUT (G) 3-10 SV. 407-1
H:VIDEO MUTE IN 2-1 SY. 504-3
H:VIDEO MUTING 1/3
REG 9V OUT 8-3
GND 8-4
RF MOD
Q306 2SC403SP-5
L301 100μH
R324 100
C318 0.01μ
R320 3k
C315 150p
L302 12μH
R321 15k
C316 0.0022μ
C317 110p
R322 15k
R323 2.2k
C308 0.047μ
C309 47μ 16V
R307 47k
R334 10k
R333 22k
SL IT2
R335 110k
R305 2.2k
R306 10k
R308 33k
C307 0.0047μ
R310 10k
R309 10k
R311 47k
R315 4.7k
L303 100μH
IC7 TC4001BP
R328 10k
R314 8.2k
R313 2.2k
R312 10k
C306 47μ 16V
C305 0.047μ
C304 0.01μ
VDD
GND
Q307 2SC2878-B
Q303 2SC2603-F
TP18
R303 2.2k
D302 1SS119
C302 100μ 16V
C303 0.01μ
R304 9.1k
C319 47μ 10V
C320 0.01μ
C321 100μ 16V

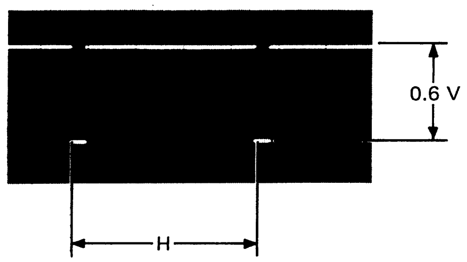
VA-35 (2/3)

1-618-603-11
VP-5020

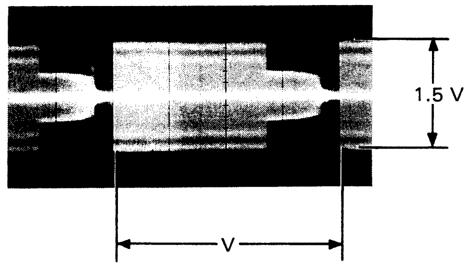
⑫ TP12



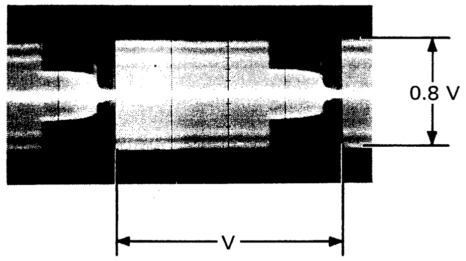
⑬ TP9



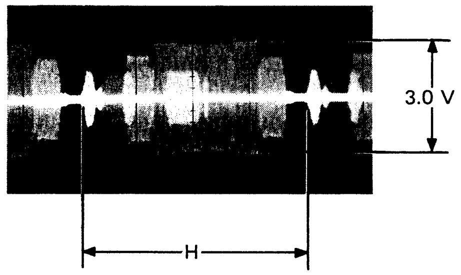
⑭ TP7



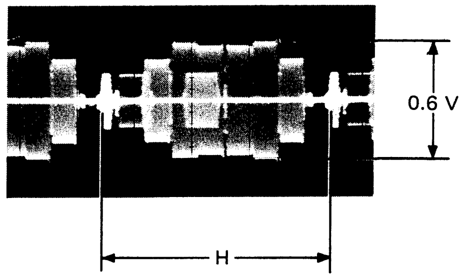
⑮ IC3-3



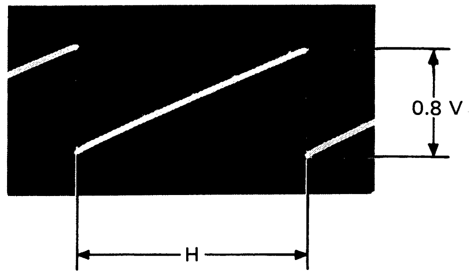
⑯ IC3-24



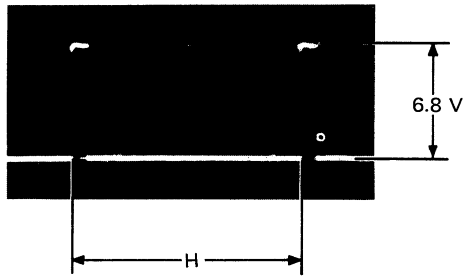
⑰ TP10



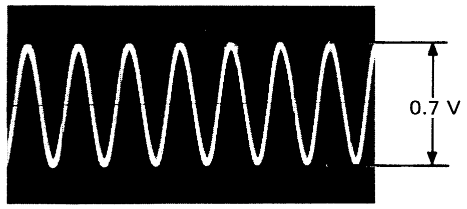
⑱ TP13



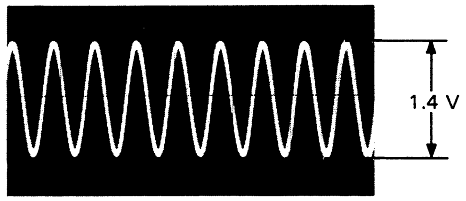
⑲ TP12



⑳ TP15

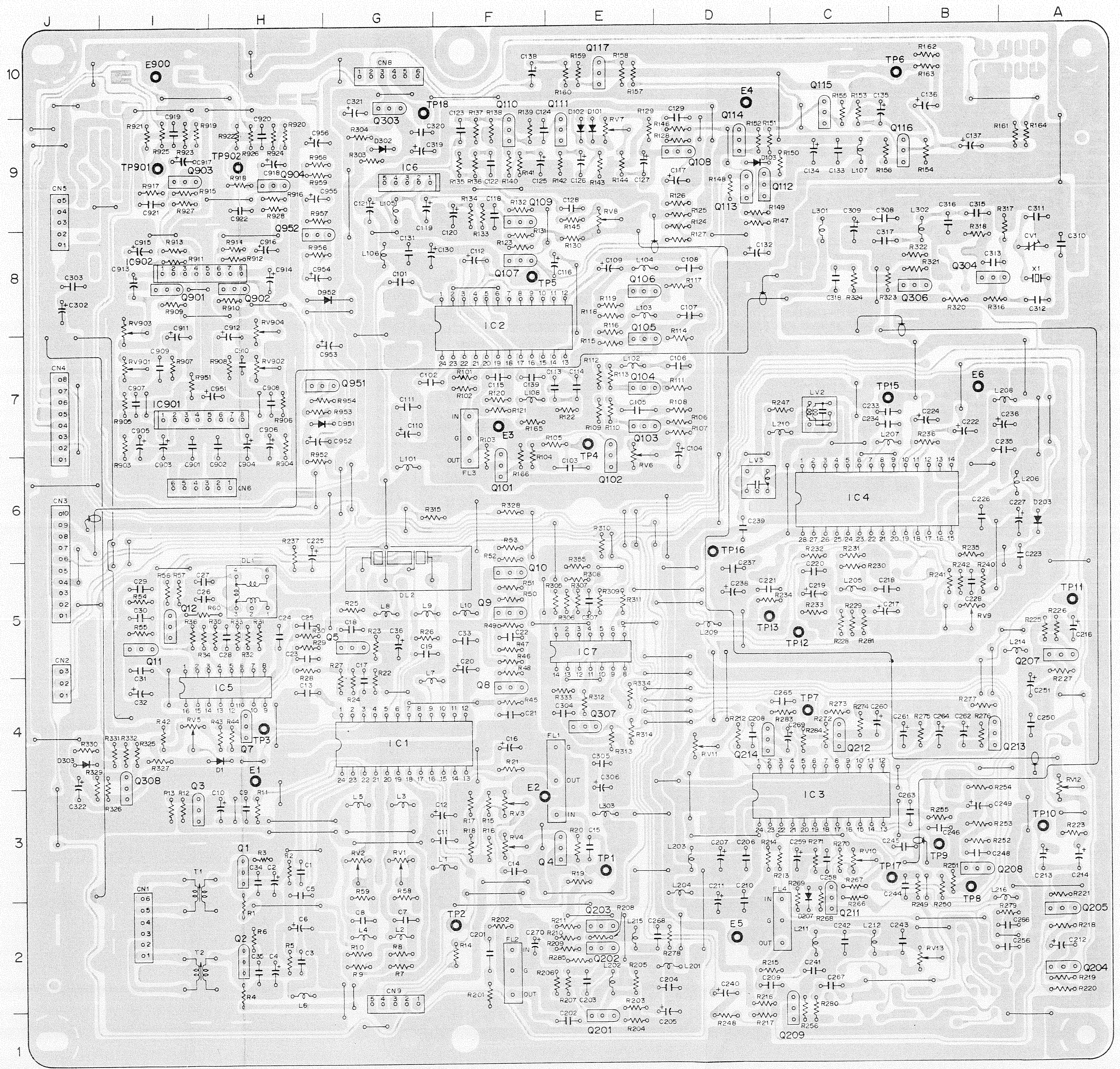


㉑ TP16

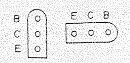


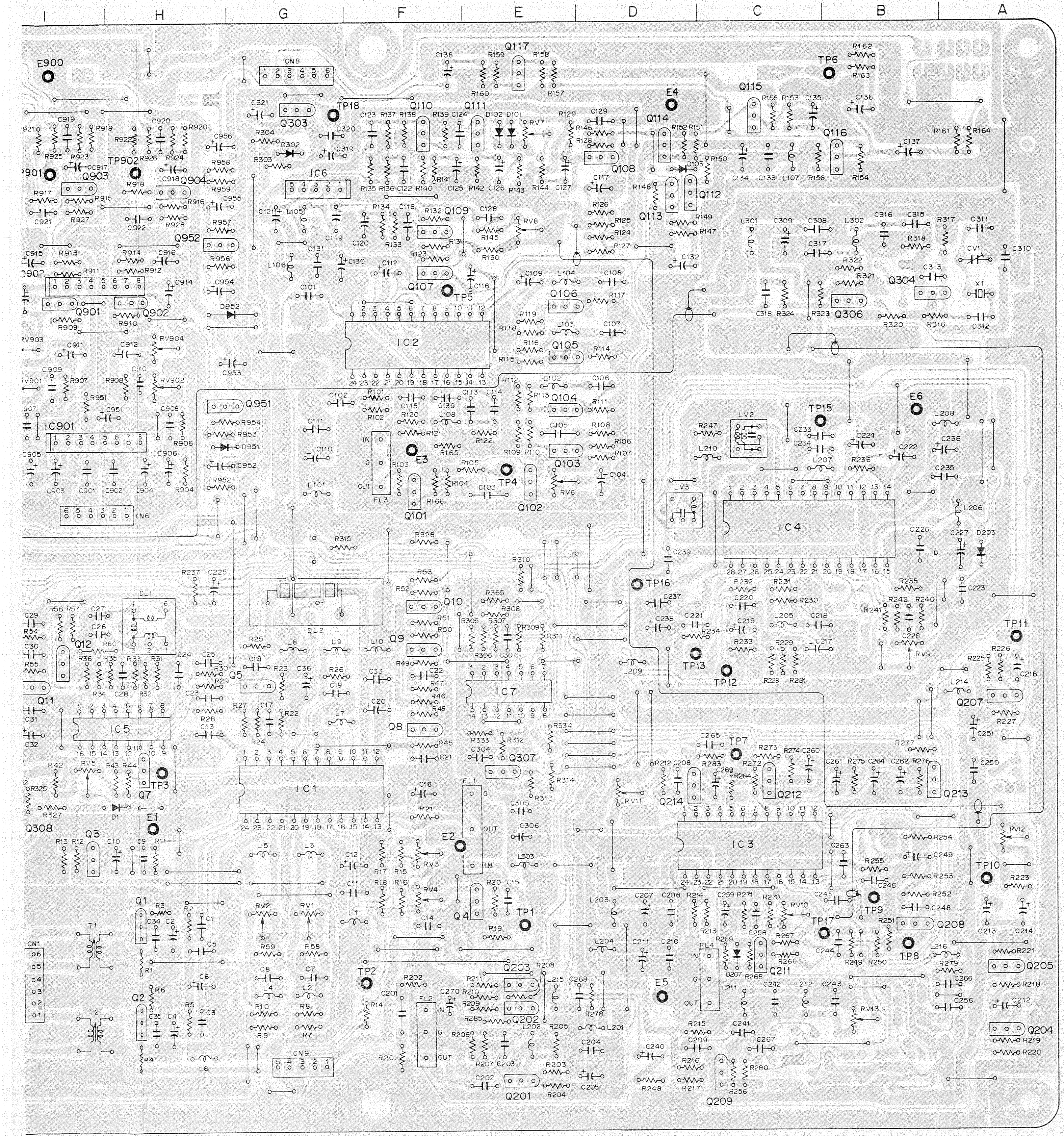
VA-35 ; VIDEO/AUDIO PB

CN1	I - 2
CN2	J - 4
CN3	J - 5
CN4	J - 7
CN5	J - 8
CN6	I - 6
CN8	G - 10
CN9	G - 2
CV1	A - 8
D1	H - 4
D101	E - 9
D102	E - 9
D103	D - 9
D203	A - 6
D207	C - 2
D302	G - 9
D303	J - 4
D951	G - 7
D952	G - 8
DL1	H - 5
DL2	G - 5
E1	H - 3
E2	F - 3
E3	F - 7
E4	D - 10
E5	D - 2
E6	B - 7
E900	I - 10
FL1	E - 3
FL2	F - 2
FL3	F - 7
FL4	C - 2
IC1	G - 4
IC2	F - 8
IC3	C - 3
IC4	C - 6
IC5	H - 4
IC6	G - 9
IC7	E - 5
IC901	I - 7
LV2	C - 7
LV3	D - 6
Q1	H - 3
Q2	H - 2
Q3	I - 3
Q4	E - 3
Q5	G - 5
Q7	H - 4
Q8	F - 4
Q9	F - 5
Q10	F - 5
Q11	I - 5
Q12	I - 5
Q101	F - 6
Q102	E - 6
Q103	E - 7
Q104	E - 7
Q105	E - 7
Q106	E - 8
Q107	F - 8
Q108	D - 9
Q109	F - 9
Q110	F - 9
Q111	E - 9
Q112	D - 9
Q113	D - 9
Q114	D - 9
Q115	C - 10
Q116	B - 9
Q117	E - 10
Q201	E - 1
Q202	E - 2
Q203	E - 2
Q204	A - 2
Q205	A - 2
Q207	A - 5
Q208	B - 3
Q209	C - 1
Q211	C - 2
Q212	C - 4
Q213	B - 4
Q214	D - 4
Q303	G - 10
Q304	B - 8
Q306	B - 8
Q307	E - 4
Q308	I - 3
Q901	I - 8
Q902	H - 8
Q903	I - 9
Q904	H - 9
Q951	H - 7
Q952	H - 8
RV1	G - 3
RV2	G - 3
RV3	F - 3
RV4	F - 3
RV5	I - 4
RV6	E - 6
RV7	E - 9
RV8	E - 9
RV9	B - 5
RV10	C - 3
RV11	D - 4
RV12	A - 4
RV13	B - 2
RV901	I - 7
RV902	H - 7
RV903	I - 8
RV904	H - 8
T1	I - 3
T2	I - 2
TP1	E - 3
TP2	F - 2
TP3	H - 4
TP4	E - 7
TP5	F - 8
TP6	B - 10
TP7	C - 4
TP8	B - 3
TP9	B - 3
TP10	A - 3
TP11	A - 5
TP12	C - 5
TP13	D - 5
TP15	C - 7
TP16	D - 6
TP17	B - 3
TP18	G - 10
TP901	I - 9
TP902	H - 9
X1	A - 8



VA-35 -SOLDERING SIDE-
1-618-603-11
VP-5020

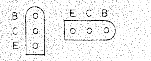



I
H
G
F
E
D
C
B
A
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC901
CN1
CN6
CN8
CN9
E1
E2
E3
E4
E5
E6
E900
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP15
TP16
TP17
TP18
TP901
TP902
FL1
FL2
FL3
FL4
DL1
DL2
LV2
LV3
T1
T2
X1

VA-35 -SOLDERING SIDE-

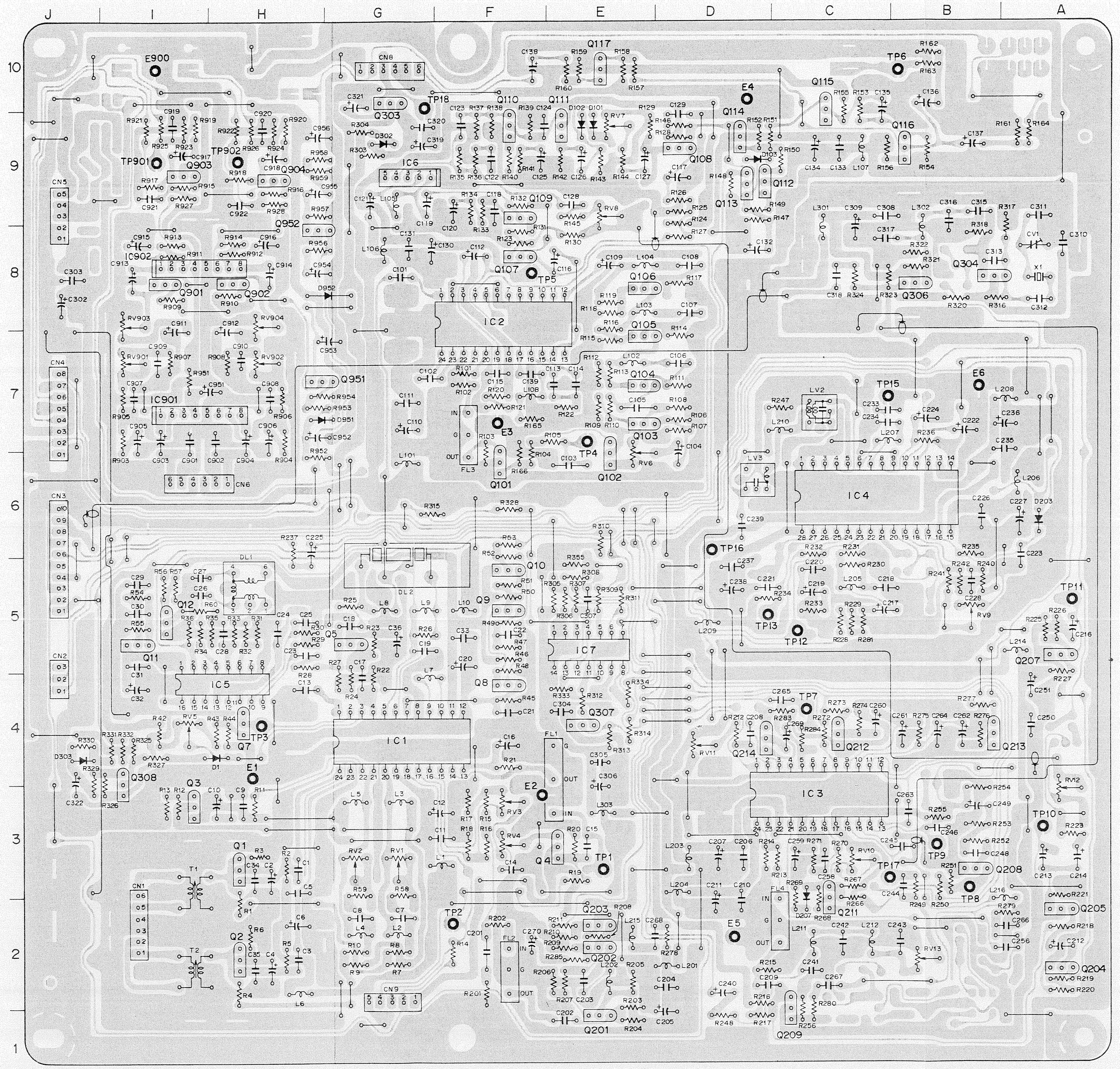
1-618-603-11

VP-5020

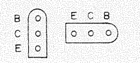


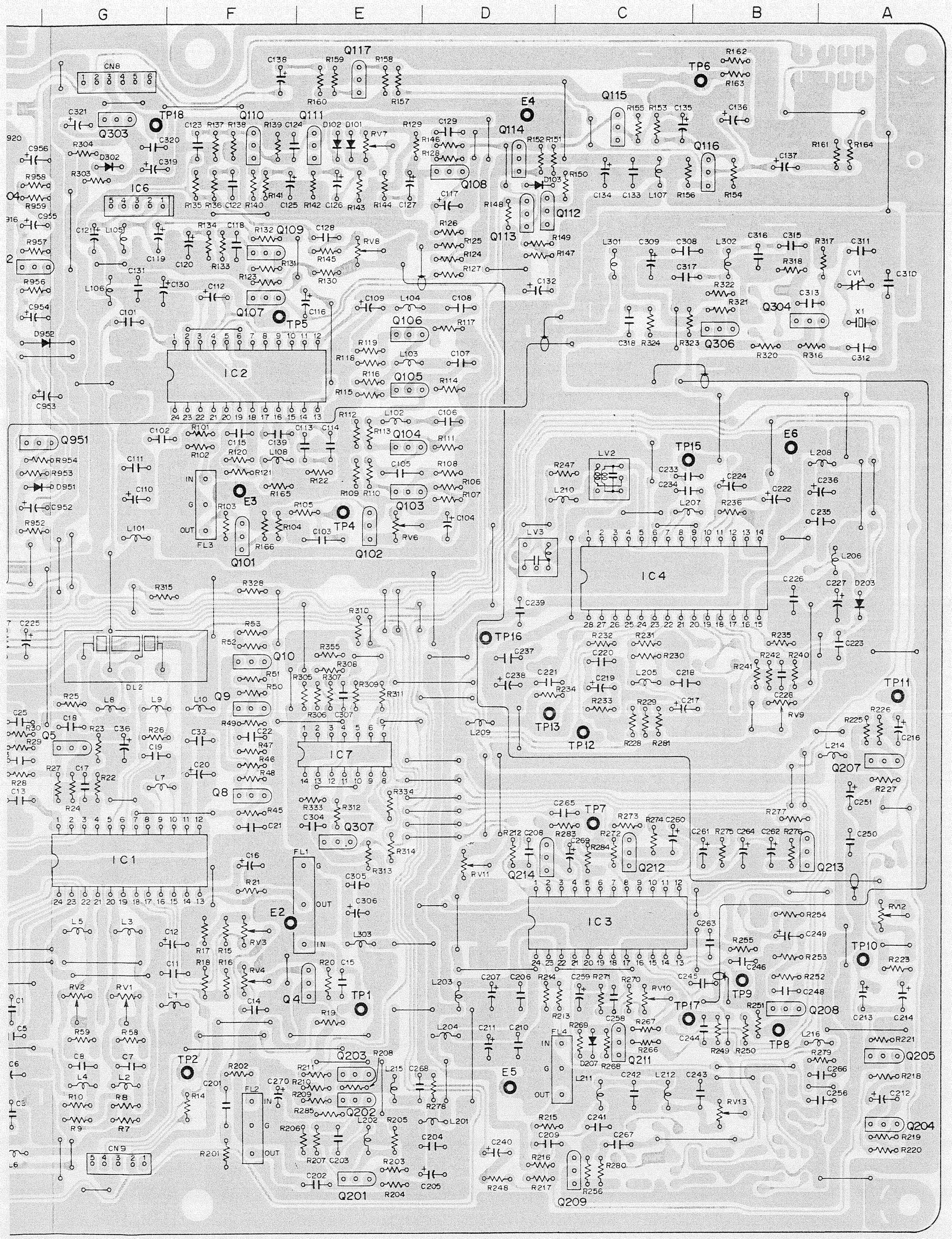
VA-35 ; VIDEO/AUDIO PB
AH-11 ; AUDIO/CTL PB HEAD

CN1	I - 2
CN2	J - 4
CN3	J - 5
CN4	J - 7
CN5	J - 8
CN6	I - 6
CN8	G - 10
CN9	G - 2
CV1	A - 8
D1	H - 4
D101	E - 9
D102	E - 9
D103	D - 9
D203	A - 6
D207	C - 2
D302	G - 9
D303	J - 4
D951	G - 7
D952	G - 8
DL1	H - 5
DL2	G - 5
E1	H - 3
E2	F - 3
E3	F - 7
E4	D - 10
E5	D - 2
E6	B - 7
E900	I - 10
FL1	E - 3
FL2	F - 2
FL3	F - 7
FL4	C - 2
IC1	G - 4
IC2	F - 8
IC3	C - 3
IC4	C - 6
IC5	H - 4
IC6	G - 9
IC7	E - 5
IC901	I - 7
LV2	C - 7
LV3	D - 6
Q1	H - 3
Q2	H - 2
Q3	I - 3
Q4	E - 3
Q5	G - 5
Q7	H - 4
Q8	F - 4
Q9	F - 5
Q10	F - 5
Q11	I - 5
Q12	I - 5
Q101	F - 6
Q102	E - 6
Q103	E - 7
Q104	E - 7
Q105	E - 7
Q106	E - 8
Q107	F - 8
Q108	D - 9
Q109	F - 9
Q110	F - 9
Q111	E - 9
Q112	D - 9
Q113	D - 9
Q114	D - 9
Q115	C - 10
Q116	B - 9
Q117	E - 10
Q201	E - 1
Q202	E - 2
Q203	E - 2
Q204	A - 2
Q205	A - 2
Q207	A - 5
Q208	B - 3
Q209	C - 1
Q211	C - 2
Q212	C - 4
Q213	B - 4
Q214	D - 4
Q303	G - 10
Q304	B - 8
Q306	B - 8
Q307	E - 4
Q308	I - 3
Q901	I - 8
Q902	H - 8
Q903	I - 9
Q904	H - 9
Q951	H - 7
Q952	H - 8
RV1	G - 3
RV2	G - 3
RV3	F - 3
RV4	F - 3
RV5	I - 4
RV6	E - 6
RV7	E - 9
RV8	E - 9
RV9	B - 5
RV10	C - 3
RV11	D - 4
RV12	A - 4
RV13	B - 2
RV901	I - 7
RV902	H - 7
RV903	I - 8
RV904	H - 8
T1	I - 3
T2	I - 2
TP1	E - 3
TP2	F - 2
TP3	H - 4
TP4	E - 7
TP5	F - 8
TP6	B - 10
TP7	C - 4
TP8	B - 3
TP9	B - 3
TP10	A - 3
TP11	A - 5
TP12	C - 5
TP13	D - 5
TP15	C - 7
TP16	D - 6
TP17	B - 3
TP18	G - 10
TP901	I - 9
TP902	H - 9
X1	A - 8

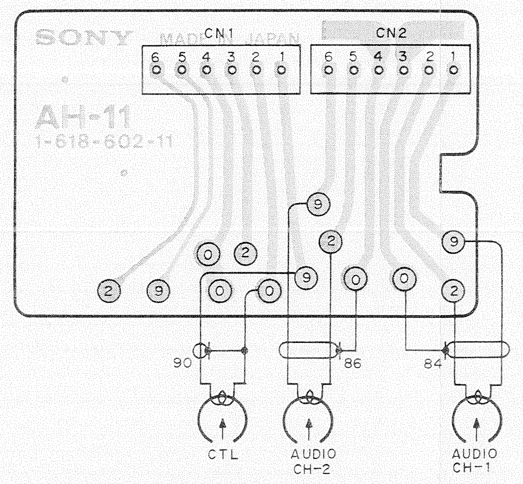

J
I
H
G
F
E
D
C
B
A
10
9
8
7
6
5
4
3
2
1
E900
TP901
TP902
Q903
Q904
IC902
Q901
Q902
IC901
CN5
CN4
CN3
CN2
CN1
CN6
CN8
CN9
Q303
TP18
IC6
Q952
Q951
D951
D952
IC2
TP5
Q107
Q109
Q110
Q111
Q117
E4
Q114
Q115
Q116
TP6
Q108
Q112
Q113
Q106
Q105
Q104
Q103
Q102
Q101
E3
TP4
FL3
Q304
Q306
CV1
X1
LV2
LV3
TP15
E6
IC4
D203
TP16
TP13
TP12
TP11
DL1
DL2
Q12
Q11
Q10
Q9
Q8
Q5
IC5
IC7
IC1
Q307
Q7
TP3
E1
D1
Q308
D303
Q3
IC3
TP7
Q212
Q213
Q214
Q207
FL1
E2
Q4
TP1
TP10
TP9
TP17
TP8
Q208
Q211
FL4
E5
Q205
Q204
Q1
T1
Q2
T2
TP2
FL2
Q203
Q202
Q201
Q209

VA-35 -SOLDERING SIDE-
1-618-603-11
VP-5020




G
F
E
D
C
B
A
IC1
IC2
IC3
IC4
IC6
IC7
CN8
CN9
DL2
FL1
FL2
FL3
FL4
LV2
LV3
X1
TP1
TP2
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP15
TP16
TP17
TP18
E2
E3
E4
E5
E6

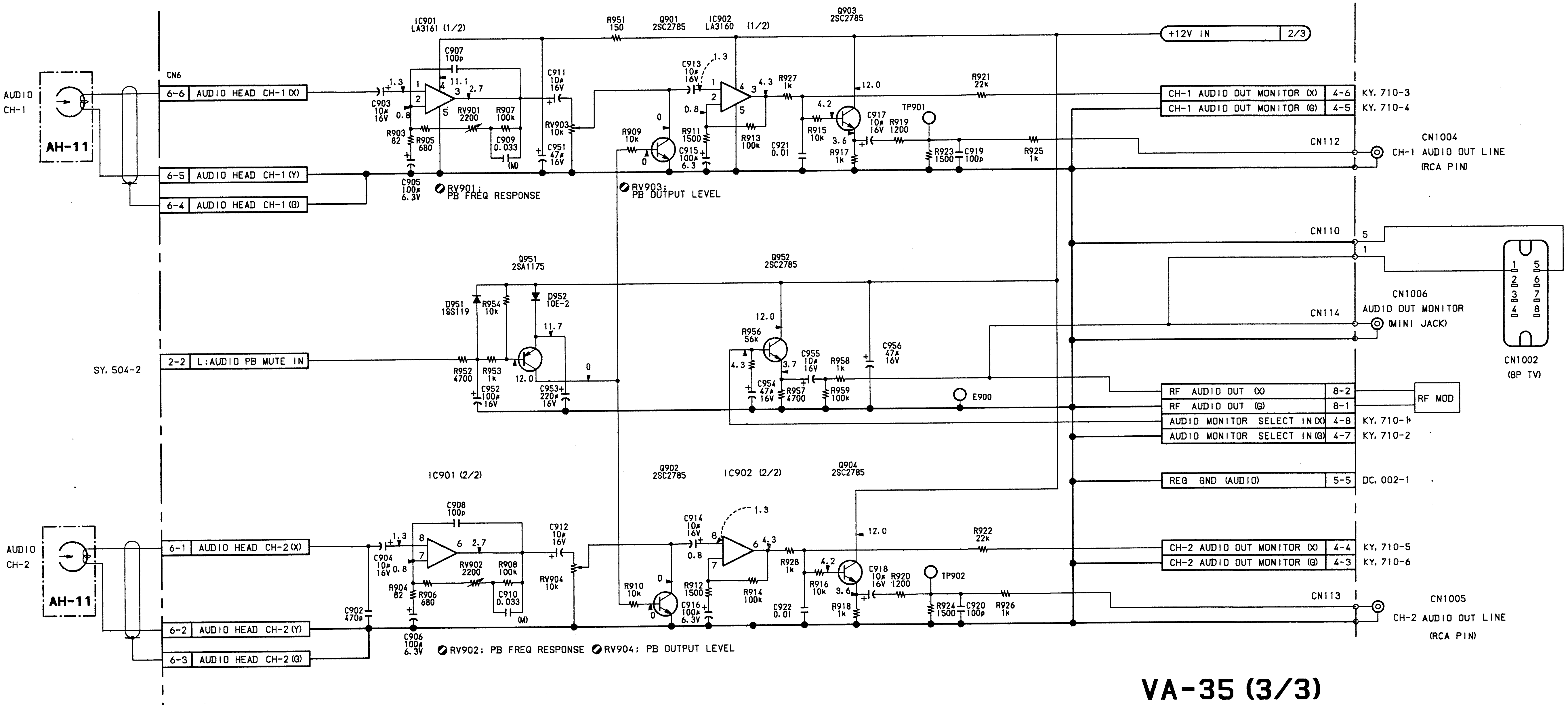
VA-35 – SOLDERING SIDE –
1-618-603-11
VP-5020


SONY
MADE IN JAPAN
CN1
CN2
6 5 4 3 2 1
6 5 4 3 2 1
AH-11
1-618-602-11
90
86
84
CTL
AUDIO CH-2
AUDIO CH-1

AH-11 – SOLDERING SIDE –
1-618-602-11
VP-5020
VP-5040

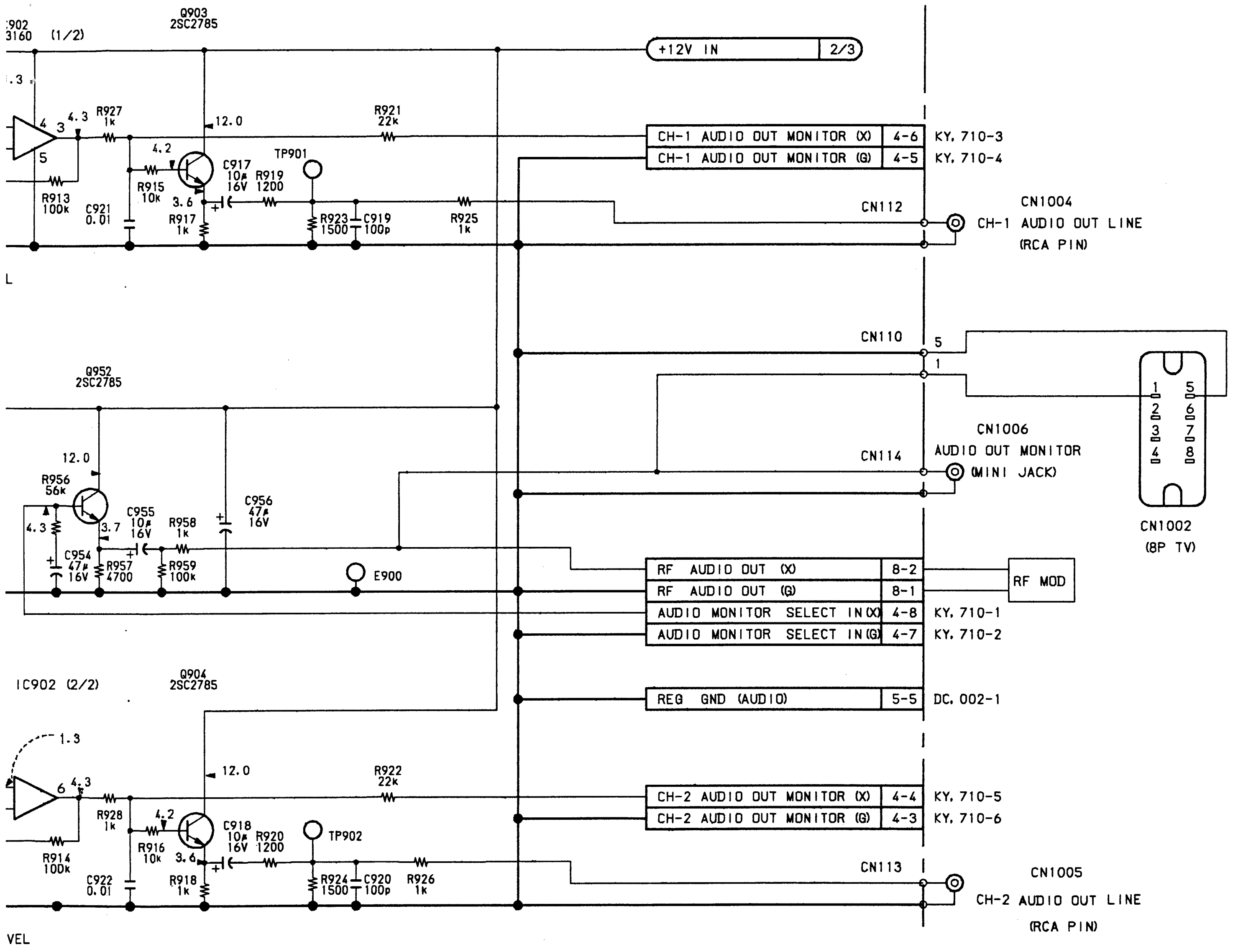
VA-35 (3/3) ; AUDIO PB AMPLIFIER

AH-11 ; AUDIO/CTL PB HEAD


AUDIO CH-1
AH-11
CN6
6-6 AUDIO HEAD CH-1 (X)
6-5 AUDIO HEAD CH-1 (Y)
6-4 AUDIO HEAD CH-1 (G)
IC901 LA3161 (1/2)
C907 100p
C903 10μ 16V
R903 82
R905 680
C905 100μ 6.3V
RV901 2200
R907 100k
C909 0.033 (M)
C911 10μ 16V
RV903 10k
C951 47μ 16V
RV901; PB FREQ RESPONSE
R951 150
Q901 2SC2785
IC902 LA3160 (1/2)
C913 10μ 16V
R909 10k
R911 1500
C915 100μ 6.3
R913 100k
C921 0.01
RV903; PB OUTPUT LEVEL
Q903 2SC2785
R927 1k
R915 10k
R917 1k
C917 10μ 16V
R919 1200
TP901
R923 1500
C919 100p
R921 22k
R925 1k
+12V IN 2/3
CH-1 AUDIO OUT MONITOR (X) 4-6 KY. 710-3
CH-1 AUDIO OUT MONITOR (G) 4-5 KY. 710-4
CN112
CN1004
CH-1 AUDIO OUT LINE (RCA PIN)
CN110
CN114
CN1006
AUDIO OUT MONITOR (MINI JACK)
CN1002 (8P TV)
SY. 504-2
2-2 L:AUDIO PB MUTE IN
Q951 2SA1175
D951 1SS119
R954 10k
D952 10E-2
R952 4700
R953 1k
C952 100μ 16V
C953 220μ 16V
Q952 2SC2785
R956 56k
C955 10μ 16V
R958 1k
C956 47μ 16V
C954 47μ 16V
R957 4700
R959 100k
E900
RF AUDIO OUT (X) 8-2
RF AUDIO OUT (G) 8-1
RF MOD
AUDIO MONITOR SELECT IN (X) 4-8 KY. 710-1
AUDIO MONITOR SELECT IN (G) 4-7 KY. 710-2
REG GND (AUDIO) 5-5 DC. 002-1
IC901 (2/2)
Q902 2SC2785
IC902 (2/2)
Q904 2SC2785
AUDIO CH-2
6-1 AUDIO HEAD CH-2 (X)
6-2 AUDIO HEAD CH-2 (Y)
6-3 AUDIO HEAD CH-2 (G)
C908 100p
C904 10μ 16V
C902 470p
R904 82
R906 680
C906 100μ 6.3V
RV902 2200
R908 100k
C910 0.033 (M)
C912 10μ 16V
RV904 10k
C914 10μ 16V
R910 10k
R912 1500
C916 100μ 6.3V
R914 100k
C922 0.01
R928 1k
R916 10k
R918 1k
C918 10μ 16V
R920 1200
TP902
R924 1500
C920 100p
R922 22k
R926 1k
RV902; PB FREQ RESPONSE
RV904; PB OUTPUT LEVEL
CH-2 AUDIO OUT MONITOR (X) 4-4 KY. 710-5
CH-2 AUDIO OUT MONITOR (G) 4-3 KY. 710-6
CN113
CN1005
CH-2 AUDIO OUT LINE (RCA PIN)
1.3
11.1
2.7
0.8
4.3
4.2
3.6
12.0
11.7
3.7

VA-35 (3/3)

1-618-603-11
VP-5020
VP-5040

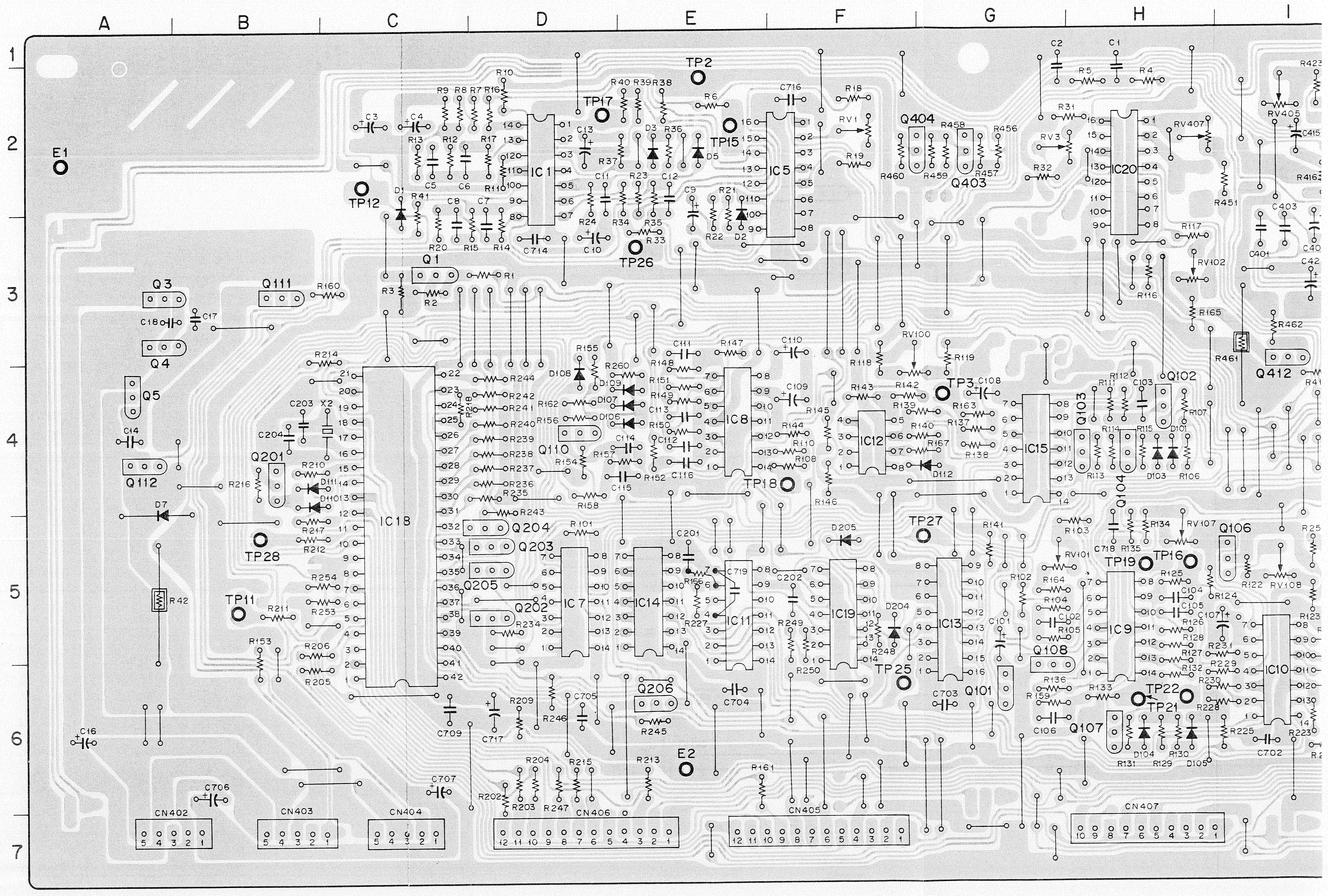

902
3160 (1/2)
Q903
2SC2785
+12V IN
2/3
R927
1k
4.3
12.0
4.2
R921
22k
CH-1 AUDIO OUT MONITOR (X)
4-6
KY. 710-3
CH-1 AUDIO OUT MONITOR (G)
4-5
KY. 710-4
TP901
C917
10µ 16V
R919
1200
R915
10k
R913
100k
C921
0.01
R917
1k
3.6
R923
1500
C919
100p
R925
1k
CN112
CN1004
CH-1 AUDIO OUT LINE
(RCA PIN)
L
CN110
5
1
Q952
2SC2785
12.0
R956
56k
4.3
3.7
C955
10µ 16V
R958
1k
C956
47µ 16V
C954
47µ 16V
R957
4700
R959
100k
E900
CN114
CN1006
AUDIO OUT MONITOR
(MINI JACK)
CN1002
(8P TV)
RF AUDIO OUT (X)
8-2
RF AUDIO OUT (G)
8-1
RF MOD
AUDIO MONITOR SELECT IN (X)
4-8
KY. 710-1
AUDIO MONITOR SELECT IN (G)
4-7
KY. 710-2
IC902 (2/2)
Q904
2SC2785
REG GND (AUDIO)
5-5
DC. 002-1
1.3
12.0
4.3
R922
22k
CH-2 AUDIO OUT MONITOR (X)
4-4
KY. 710-5
CH-2 AUDIO OUT MONITOR (G)
4-3
KY. 710-6
R928
1k
4.2
R916
10k
3.6
C918
10µ 16V
R920
1200
TP902
R914
100k
C922
0.01
R918
1k
R924
1500
C920
100p
R926
1k
CN113
CN1005
CH-2 AUDIO OUT LINE
(RCA PIN)
VEL

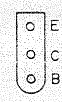
VA-35 (3/3)

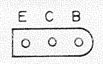
1-618-603-11
VP-5020
VP-5040

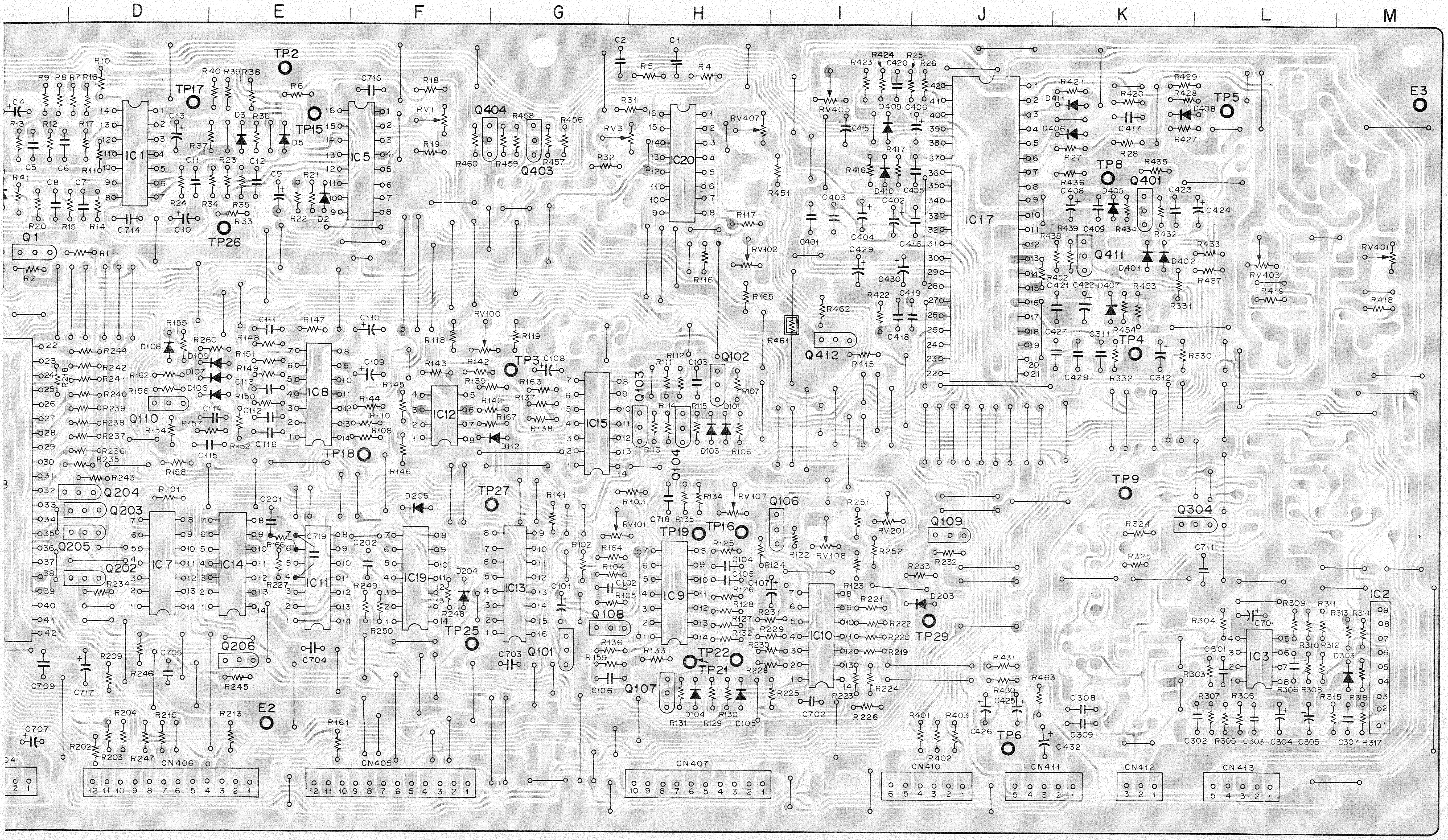
SV-74 ; DRUM/CAPSTAN PWM SERVO

CN402	B - 7
CN403	B - 7
CN404	C - 7
CN405	F - 7
CN406	D - 7
CN410	J - 7
CN411	K - 7
CN412	K - 7
CN413	L - 7
D1	C - 2
D2	E - 2
D3	E - 2
D5	E - 2
D7	A - 4
D101	H - 4
D103	H - 4
D104	H - 6
D105	H - 6
D106	E - 4
D107	E - 4
D108	D - 4
D109	E - 4
D110	B - 4
D111	B - 4
D112	G - 4
D203	J - 5
D204	F - 5
D205	F - 5
D303	M - 6
D401	K - 3
D402	K - 3
D405	K - 3
D406	K - 2
D407	K - 3
D408	K - 2
D409	I - 2
D410	I - 2
D411	K - 2
E1	A - 2
E2	E - 6
E3	M - 2
IC1	D - 2
IC2	M - 6
IC3	L - 6
IC5	F - 2
IC7	D - 5
IC8	E - 4
IC9	H - 5
IC10	I - 6
IC11	E - 5
IC12	F - 4
IC13	G - 5
IC14	E - 5
IC15	G - 4
IC17	J - 3
IC18	C - 5
IC19	F - 5
IC20	H - 2
Q1	C - 3
Q3	A - 3
Q4	A - 3
Q5	A - 4
Q101	G - 6
Q102	H - 4
Q103	H - 4
Q104	H - 4
Q106	I - 5
Q107	H - 6
Q108	G - 6
Q109	J - 5
Q110	D - 4
Q111	B - 3
Q112	A - 4
Q201	B - 4
Q202	D - 5
Q203	D - 5
Q204	D - 5
Q205	D - 5
Q206	E - 6
Q304	L - 5
Q401	K - 3
Q403	G - 2
Q404	G - 2
Q411	K - 3
Q412	I - 3
RV1	F - 2
RV3	H - 2
RV100	G - 3
RV101	H - 5
RV102	H - 3
RV106	I - 5
RV107	H - 4
RV201	I - 5
RV401	M - 3
RV403	L - 3
RV405	I - 2
RV407	H - 2
TP2	E - 2
TP3	G - 4
TP4	K - 4
TP5	L - 2
TP6	J - 6
TP8	K - 2
TP9	K - 5
TP11	B - 5
TP12	C - 2
TP15	E - 2
TP16	H - 5
TP17	D - 2
TP18	F - 4
TP19	H - 5
TP21	H - 6
TP22	H - 6
TP25	F - 6
TP26	E - 3
TP27	G - 5
TP28	B - 5
TP29	J - 5
X2	C - 4


A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
E1
E2
TP2
TP3
TP11
TP12
TP15
TP16
TP17
TP18
TP19
TP21
TP22
TP25
TP26
TP27
TP28
IC1
IC5
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC18
IC19
IC20
Q1
Q3
Q4
Q5
Q101
Q102
Q103
Q104
Q106
Q107
Q108
Q110
Q111
Q112
Q201
Q202
Q203
Q204
Q205
Q206
Q403
Q404
Q412
X2
CN402
CN403
CN404
CN405
CN406
CN407

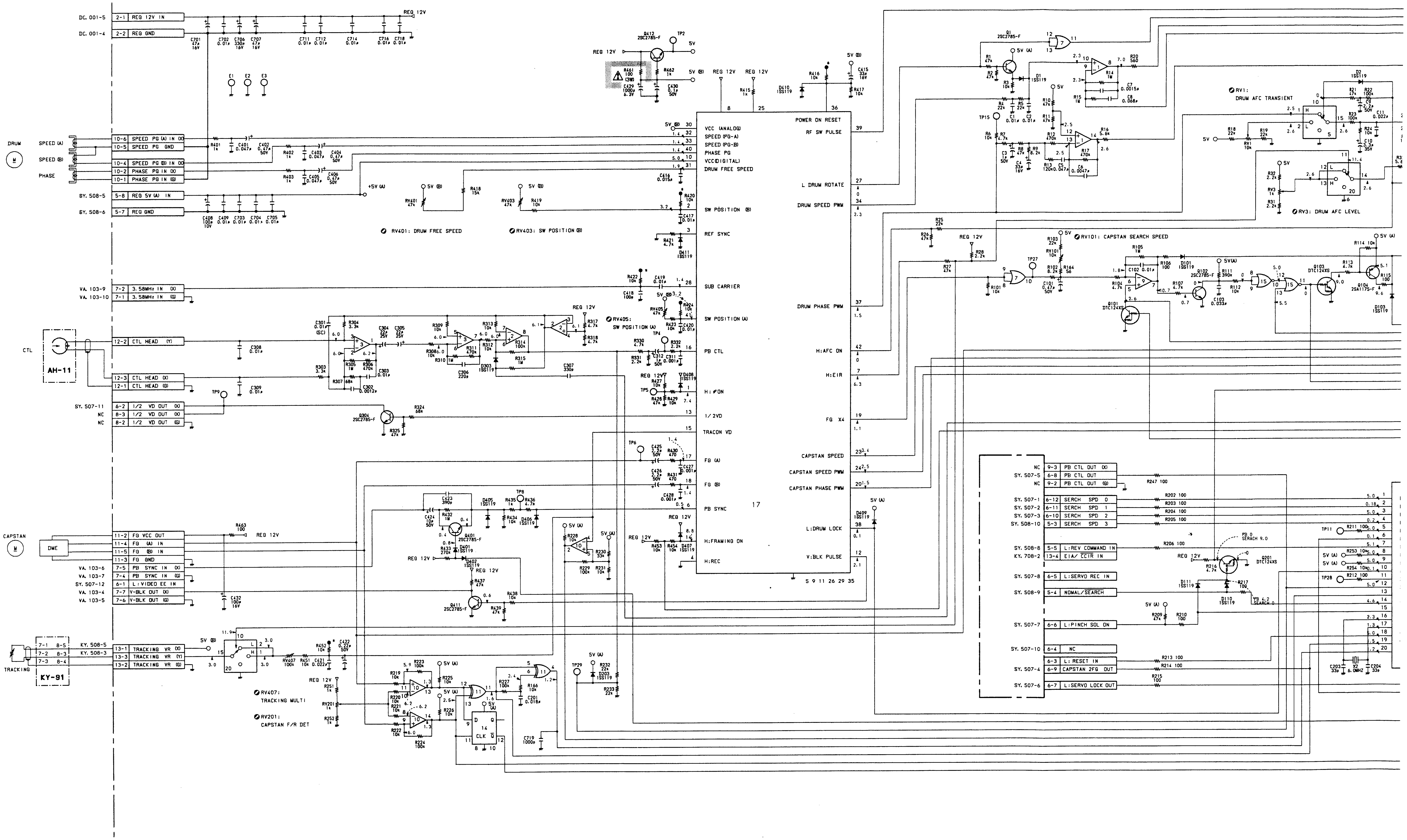


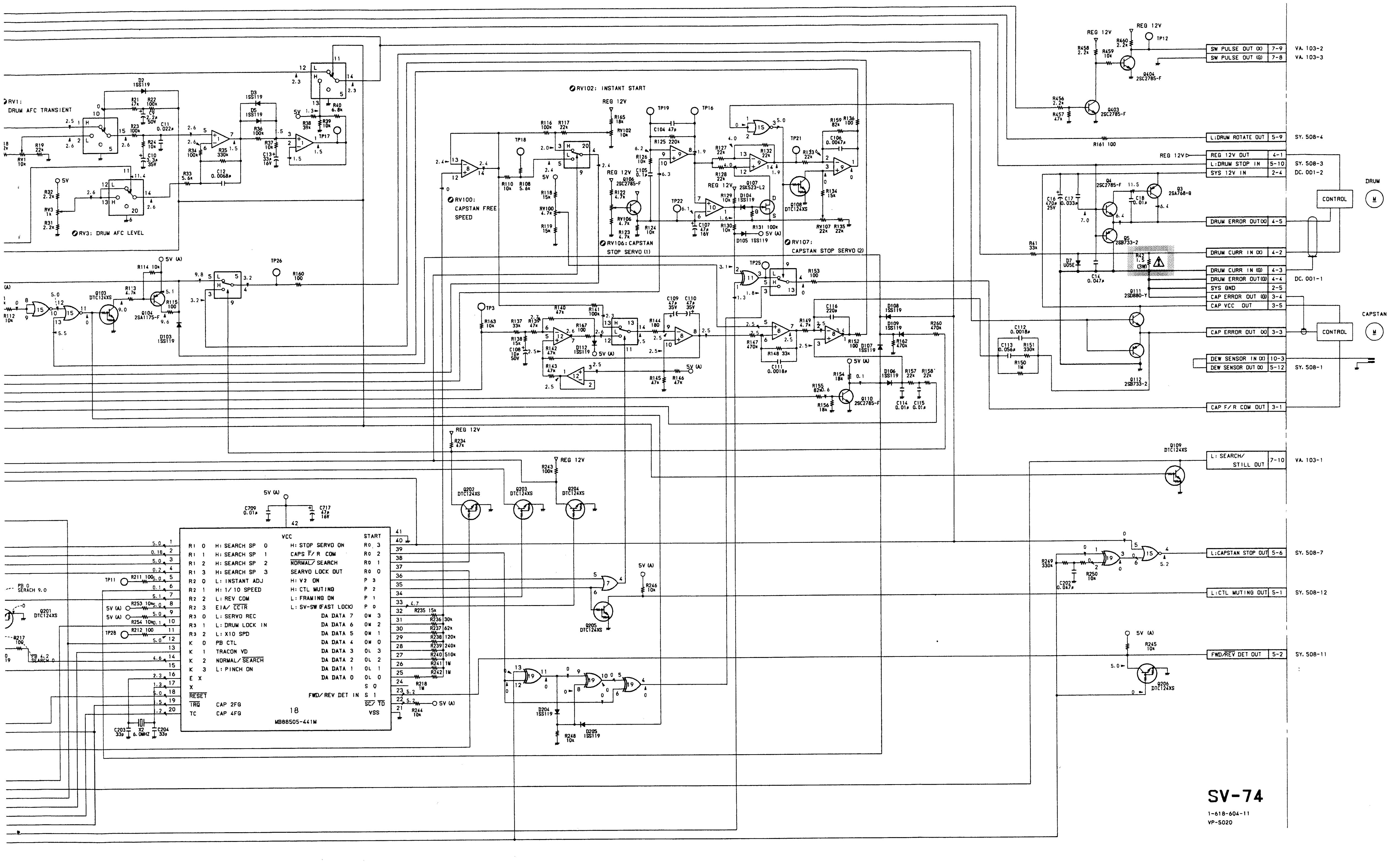



D
E
F
G
H
I
J
K
L
M
IC1
IC5
IC20
IC17
IC8
IC12
IC15
IC7
IC14
IC11
IC19
IC13
IC9
IC10
IC3
IC2
Q1
Q110
Q204
Q203
Q205
Q202
Q206
Q404
Q403
Q401
Q411
Q412
Q102
Q103
Q104
Q106
Q108
Q101
Q107
Q109
Q304
TP2
TP17
TP15
TP26
TP5
TP8
TP3
TP18
TP4
TP27
TP9
TP19
TP16
TP25
TP22
TP21
TP29
TP6
E2
E3
RV1
RV3
RV407
RV405
RV102
RV100
RV403
RV401
RV107
RV101
RV201
RV108
CN406
CN405
CN407
CN410
CN411
CN412
CN413

SV-74 -SOLDERING SIDE-
1-618-604-11
VP-5020

SV-74 ; DRUM/CAPSTAN PWM SERVO


DC. 001-5
DC. 001-4
2-1 REG 12V IN
2-2 REG GND
REG 12V
DRUM
SPEED (A)
SPEED (B)
PHASE
10-6 SPEED PG (A) IN (X)
10-5 SPEED PG GND
10-4 SPEED PG (B) IN (X)
10-2 PHASE PG IN (X)
10-1 PHASE PG IN (G)
SY. 508-5
SY. 508-6
5-8 REG 5V (A) IN
5-7 REG GND
RV401: DRUM FREE SPEED
RV403: SW POSITION (B)
VA. 103-9
VA. 103-10
7-2 3.58MHz IN (X)
7-1 3.58MHz IN (G)
CTL
AH-11
12-2 CTL HEAD (Y)
12-3 CTL HEAD (X)
12-1 CTL HEAD (G)
SY. 507-11
NC
NC
6-2 1/2 VD OUT (X)
8-3 1/2 VD OUT (Y)
8-2 1/2 VD OUT (G)
CAPSTAN
DME
11-2 FG VCC OUT
11-4 FG (A) IN
11-5 FG (B) IN
11-3 FG GND
VA. 103-6
VA. 103-7
SY. 507-12
VA. 103-4
VA. 103-5
7-5 PB SYNC IN (X)
7-4 PB SYNC IN (G)
6-1 L:VIDEO EE IN
7-7 V-BLK OUT (X)
7-6 V-BLK OUT (G)
TRACKING
KY-91
KY. 508-5
KY. 508-3
13-1 TRACKING VR (X)
13-3 TRACKING VR (Y)
13-2 TRACKING VR (G)
RV407: TRACKING MULTI
RV201: CAPSTAN F/R DET
RV405: SW POSITION (A)
VCC (ANALOG)
SPEED (FG-A)
SPEED (FG-B)
PHASE PG
VCC (DIGITAL)
DRUM FREE SPEED
SW POSITION (B)
REF SYNC
SUB CARRIER
SW POSITION (A)
PB CTL
H:ØON
1/2VD
TRACON VD
FG (A)
FG (B)
PB SYNC
H:FRAMING ON
H:REC
POWER ON RESET
RF SW PULSE
L DRUM ROTATE
DRUM SPEED PWM
DRUM PHASE PWM
H:AFC ON
H:EIR
FG X4
CAPSTAN SPEED
CAPSTAN SPEED PWM
CAPSTAN PHASE PWM
L:DRUM LOCK
V:BLK PULSE
17
5 9 11 26 29 35
RV1: DRUM AFC TRANSIENT
RV3: DRUM AFC LEVEL
RV101: CAPSTAN SEARCH SPEED
SY. 507-5
9-3 PB CTL OUT (X)
6-8 PB CTL OUT
9-2 PB CTL OUT (G)
SY. 507-1
SY. 507-2
SY. 507-3
SY. 508-10
6-12 SERCH SPD 0
6-11 SERCH SPD 1
6-10 SERCH SPD 2
5-3 SERCH SPD 3
SY. 508-8
KY. 708-2
5-5 L:REV COMMAND IN
13-4 EIA/CCIR IN
SY. 507-8
6-5 L:SERVO REC IN
SY. 508-9
5-4 NOMAL/SEARCH
SY. 507-7
6-6 L:PINCH SOL ON
SY. 507-10
6-4 NC
SY. 507-4
6-3 L:RESET IN
6-9 CAPSTAN 2FG OUT
SY. 507-6
6-7 L:SERVO LOCK OUT
PB 0 SERACH 9.0
PB 4.2 SEARCH 0
Q412 2SC2785-F
Q304 2SC2785-F
Q401 2SC2785-F
Q411 2SC2785-F
Q1 2SC2785-F
Q101 DTC124XS
Q102 2SC2785-F
Q103 DTC124XS
Q104 2SA1175-F
Q201 DTC124XS
X2 6.0MHZ


RV1: DRUM AFC TRANSIENT
RV3: DRUM AFC LEVEL
RV100: CAPSTAN FREE SPEED
RV102: INSTANT START
RV106: CAPSTAN STOP SERVO (1)
RV107: CAPSTAN STOP SERVO (2)
REG 12V
5V (A)
VCC
START
R1 0 H: SEARCH SP 0
R1 1 H: SEARCH SP 1
R1 2 H: SEARCH SP 2
R1 3 H: SEARCH SP 3
R2 0 L: INSTANT ADJ
R2 1 H: 1/10 SPEED
R2 2 L: REV COM
R2 3 EIA/ $\overline{\text{CCIR}}$
R3 0 L: SERVO REC
R3 1 L: DRUM LOCK IN
R3 2 L: X10 SPD
K 0 PB CTL
K 1 TRACON VD
K 2 NORMAL/ $\overline{\text{SEARCH}}$
K 3 L: PINCH ON
E X
X
$\overline{\text{RESET}}$
$\overline{\text{TRG}}$ CAP 2FG
TC CAP 4FG
H: STOP SERVO ON RO 3
CAPS $\overline{\text{F}}$/ R COM RO 2
$\overline{\text{NORMAL}}$/ SEARCH RO 1
SEARVO LOCK OUT RO 0
H: V2 ON P 3
H: CTL MUTING P 2
L: FRAMING ON P 1
L: SV-SW (FAST LOCK) P 0
DA DATA 7 OM 3
DA DATA 6 OM 2
DA DATA 5 OM 1
DA DATA 4 OM 0
DA DATA 3 OL 3
DA DATA 2 OL 2
DA DATA 1 OL 1
DA DATA 0 OL 0
S 0
FWD/ REV DET IN S 1
$\overline{\text{SC}}$/ $\overline{\text{TD}}$
VSS
18
MB88505-441M
SW PULSE OUT (X) 7-9 VA. 103-2
SW PULSE OUT (G) 7-8 VA. 103-3
L:DRUM ROTATE OUT 5-9 SY. 508-4
REG 12V OUT 4-1
L:DRUM STOP IN 5-10 SY. 508-3
SYS 12V IN 2-4 DC. 001-2
DRUM ERROR OUT(X) 4-5
DRUM CURR IN (X) 4-2
DRUM CURR IN (G) 4-3
DRUM ERROR OUT(G) 4-4 DC. 001-1
SYS GND 2-5
CAP ERROR OUT (G) 3-4
CAP VCC OUT 3-5
CAP ERROR OUT (X) 3-3
DEW SENSOR IN (X) 10-3
DEW SENSOR OUT (X) 5-12 SY. 508-1
CAP F/R COM OUT 3-1
L: SEARCH/ STILL OUT 7-10 VA. 103-1
L:CAPSTAN STOP OUT 5-6 SY. 508-7
L:CTL MUTING OUT 5-1 SY. 508-12
FWD/REV DET OUT 5-2 SY. 508-11
CONTROL
DRUM
CAPSTAN
M

SV-74

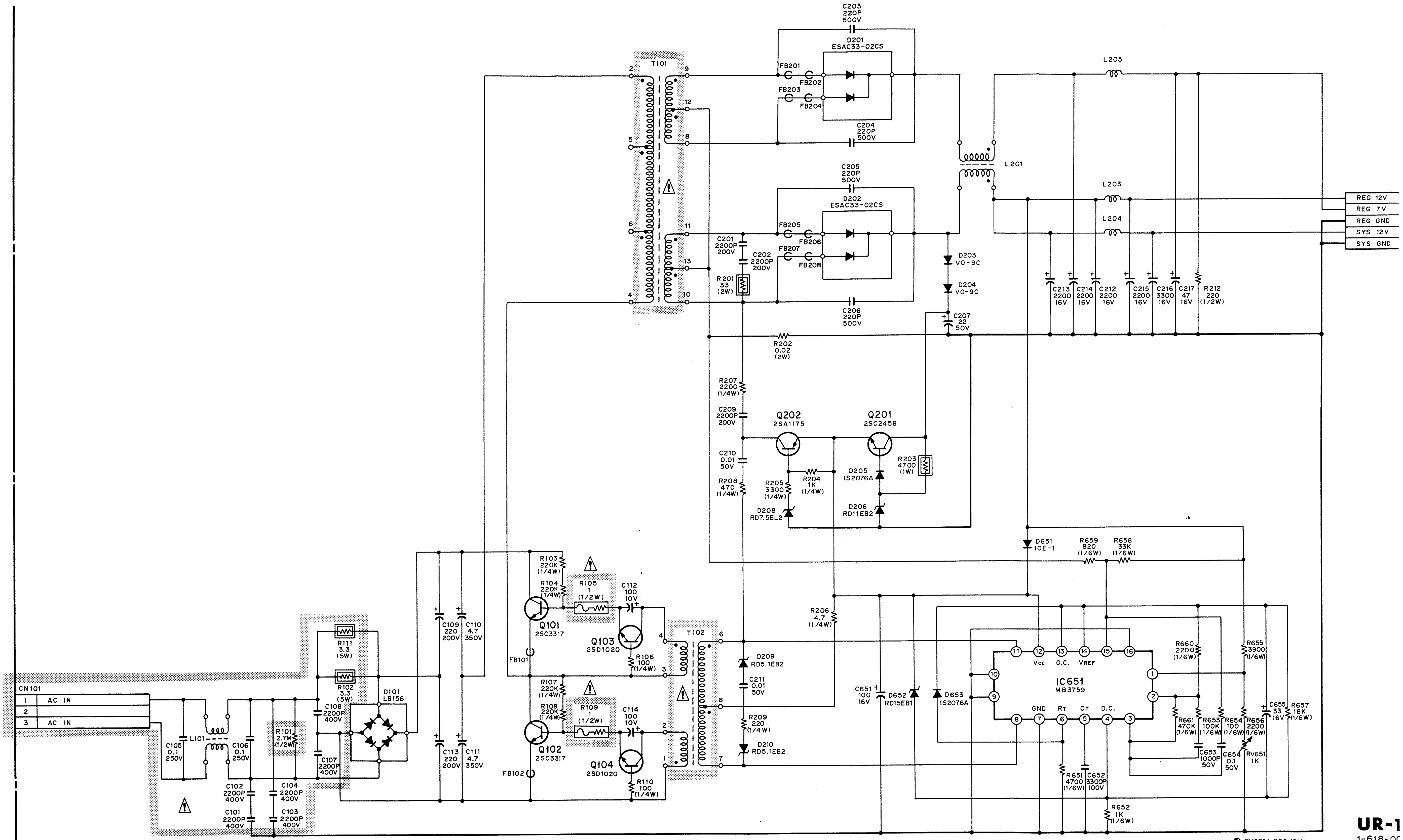
1-618-604-11
VP-5020

REF	TYPE	VCC VDD +12V	VCC VDD +5V (A)	GND
IC1		4		11
IC2	NJM4558S	1, 9		5
IC3	NJM4558DD	8		4
IC4	TC4081BP	14		7
IC5	TC4053BP	16		7, 8
IC6	TC4053BP	16		7, 8
IC7	TC4071BP		14	7
IC8	UPC324C	4		11
IC9	UPC324C	4		11
IC10	UPC339C	3		12
IC11	TC4030BP		14	7
IC12	NJM4558D	8		4
IC13	TC4053BP		16	7, 8
IC14	MB84013B		14	7
IC15	TC4001BP		14	7
IC16	TC4053BP	16		7, 8
IC17	CX-194B			
IC18	MB88501-441M		42	21
IC19	TC4030BP		14	7
IC20	TC4053BP	16		7, 8

NOTE:

**The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.**

UR-14 ; SWITCHING REGULATOR

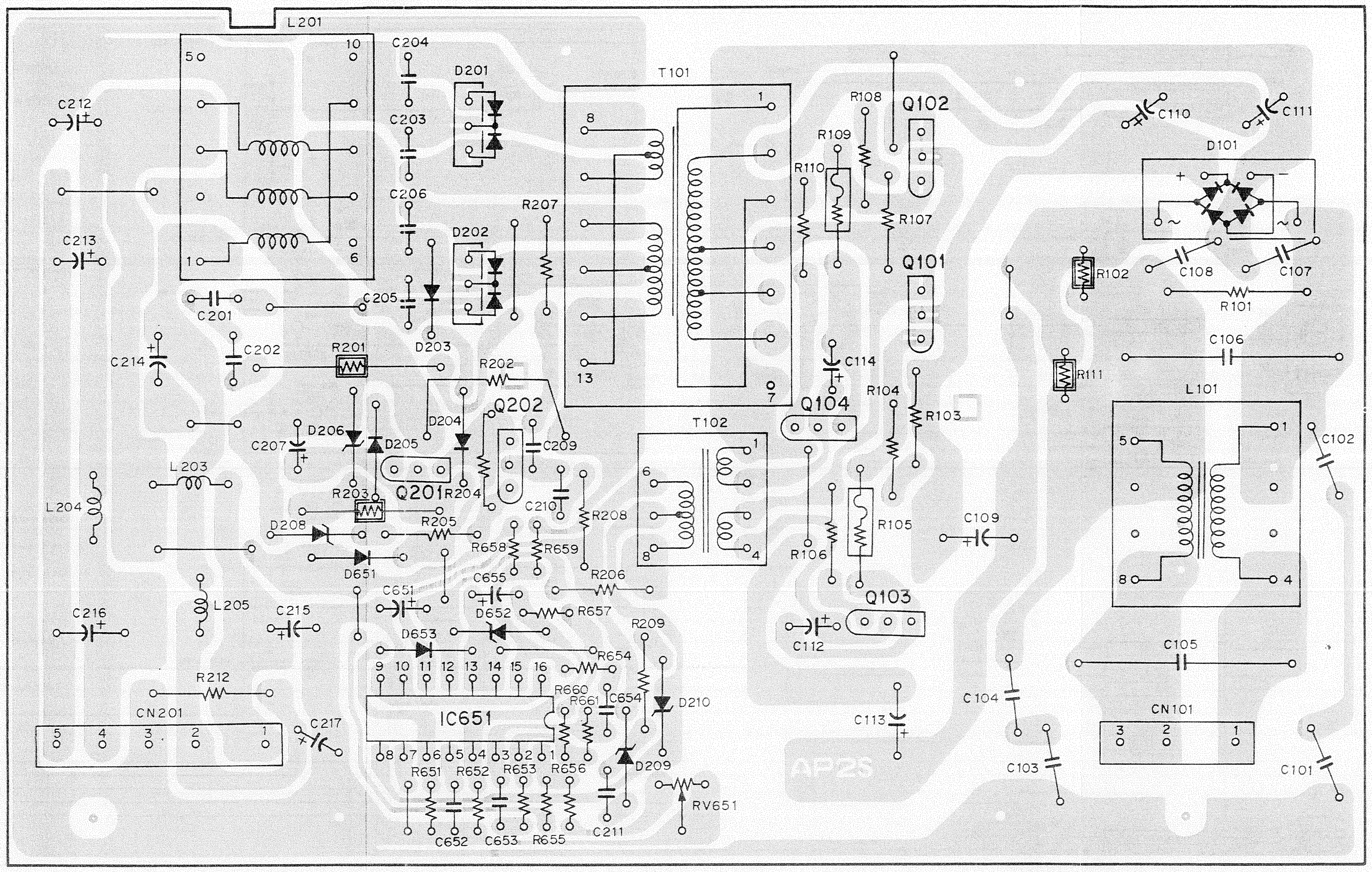

CN101
1 AC IN
2
3 AC IN
C105 0.1 250V
L101
C106 0.1 250V
C102 2200P 400V
C101 2200P 400V
C104 2200P 400V
C103 2200P 400V
R101 2.7M (1/2W)
R111 3.3 (5W)
R102 3.3 (5W)
C108 2200P 400V
C107 2200P 400V
D101 LB156
C109 220 200V
C110 4.7 350V
C113 220 200V
C111 4.7 350V
R103 220K (1/4W)
R104 220K (1/4W)
R105 1 (1/2W)
C112 100 10V
Q101 2SC3317
Q103 2SD1020
R106 100 (1/4W)
FB101
R107 220K (1/4W)
R108 220K (1/4W)
R109 1 (1/2W)
C114 100 10V
Q102 2SC3317
Q104 2SD1020
R110 100 (1/4W)
FB102
T101
T102
D209 RD5.1EB2
C211 0.01 50V
R209 220 (1/4W)
D210 RD5.1EB2
R206 4.7 (1/4W)
C203 220P 500V
D201 ESAC33-02CS
FB201
FB202
FB203
FB204
C204 220P 500V
C205 220P 500V
D202 ESAC33-02CS
FB205
FB206
FB207
FB208
C201 2200P 200V
C202 2200P 200V
R201 33 (2W)
C206 220P 500V
L205
L201
L203
L204
D203 VO-9C
D204 VO-9C
C207 22 50V
C213 2200 16V
C214 2200 16V
C212 2200 16V
C215 2200 16V
C216 3300 16V
C217 47 16V
R212 220 (1/2W)
REG 12V
REG 7V
REG GND
SYS 12V
SYS GND
R202 0.02 (2W)
R207 2200 (1/4W)
C209 2200P 200V
C210 0.01 50V
R208 470 (1/4W)
Q202 2SA1175
Q201 2SC2458
R205 3300 (1/4W)
R204 1K (1/4W)
D205 1S2076A
R203 4700 (1W)
D208 RD7.5EL2
D206 RD11EB2
D651 10E-1
R659 820 (1/6W)
R658 33K (1/6W)
C651 100 16V
D652 RD15EB1
D653 1S2076A
IC651 MB3759
Vcc O.C. VREF
GND RT CT D.C.
R651 4700 (1/6W)
C652 3300P 100V
R652 1K (1/6W)
R660 2200 (1/6W)
R661 470K (1/6W)
R653 100K (1/6W)
C653 1000P 50V
R654 100 (1/6W)
C654 0.1 50V
R656 2200 (1/6W)
RV651 1K
R655 3900 (1/6W)
C655 33 16V
R657 18K (1/6W)

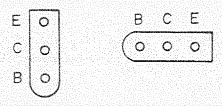
RV651 ; REG 12V

UR-1
1-618-0
VP-502

CN102
REG 12V 1
REG 7V 2
REG GND 3
SYS 12V 4
SYS GND 5
R655 3900 (1/6W)
C655 33 16V
R657 18K (1/6W)
R656 2200 (1/6W)
RV651 1K
RV651; REG 12V

UR-14
1-618-009-11
VP-5020


L201
C204
D201
C203
C206
D202
C205
D203
C212
C213
C201
C214
C202
R201
R202
R207
D204
Q202
C209
D206
D205
C207
L203
Q201
R204
R203
R205
L204
D208
D651
R658
R659
C210
R208
C651
C655
R206
D652
R657
L205
C215
C216
D653
R209
R654
R212
CN201
5 4 3 2 1
C217
IC651
R660
R661
C654
D210
D209
R651 R652 R653 R656
RV651
C652 C653 R655
C211
T101
8 1 13 7
R108
Q102
R109
R110
R107
Q101
C114
Q104
R104
R103
T102
6 1 8 4
R106
R105
Q103
C112
C109
C113
AP2S
C110
C111
D101
R102
C108
C107
R101
C106
R111
L101
5 1 8 4
C102
C105
CN101
3 2 1
C104
C103
C101

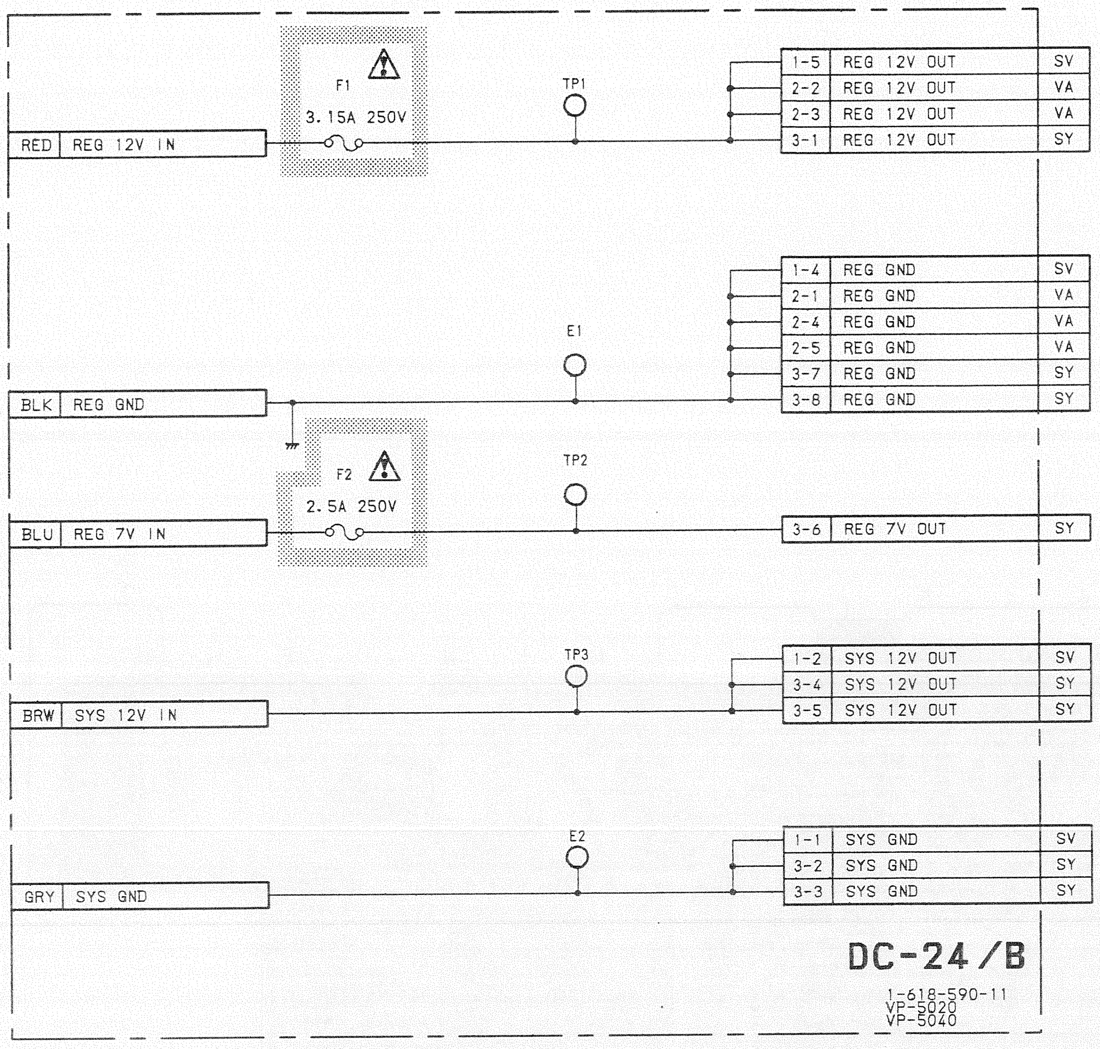


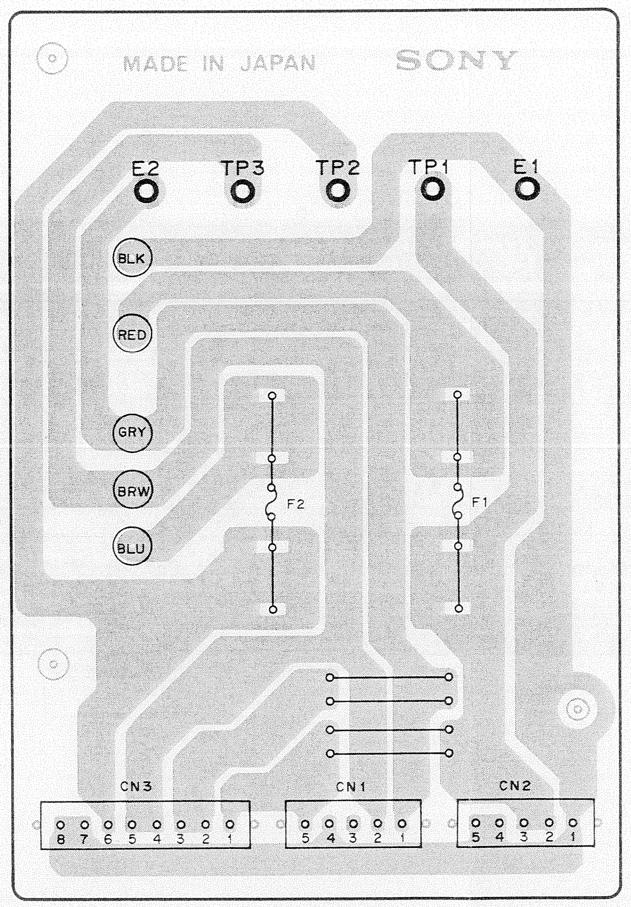
UR-14 —SOLDERING SIDE—
1-618-009-11
VP-5020

NOTE:

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

DC-24 ; DC SUPPLY/FUSE


F1
3.15A 250V
TP1
RED REG 12V IN
1-5 REG 12V OUT SV
2-2 REG 12V OUT VA
2-3 REG 12V OUT VA
3-1 REG 12V OUT SY
E1
1-4 REG GND SV
2-1 REG GND VA
2-4 REG GND VA
2-5 REG GND VA
3-7 REG GND SY
3-8 REG GND SY
BLK REG GND
F2
2.5A 250V
TP2
BLU REG 7V IN
3-6 REG 7V OUT SY
TP3
1-2 SYS 12V OUT SV
3-4 SYS 12V OUT SY
3-5 SYS 12V OUT SY
BRW SYS 12V IN
E2
1-1 SYS GND SV
3-2 SYS GND SY
3-3 SYS GND SY
GRY SYS GND
DC-24/B
1-618-590-11
VP-5020
VP-5040


MADE IN JAPAN
SONY
E2
TP3
TP2
TP1
E1
BLK
RED
GRY
BRW
BLU
F2
F1
CN3
CN1
CN2
8 7 6 5 4 3 2 1
5 4 3 2 1
5 4 3 2 1

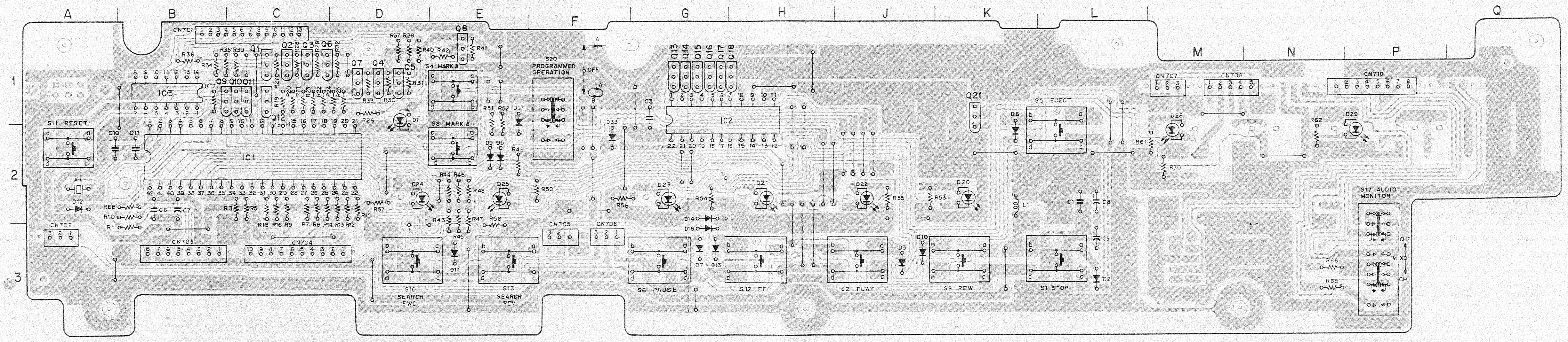
DC-24 - SOLDERING SIDE -
1-618-590-11
VP-5020

NOTE:

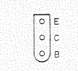
The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

KY-91 ; FUNCTION KEY AND DISPLAY

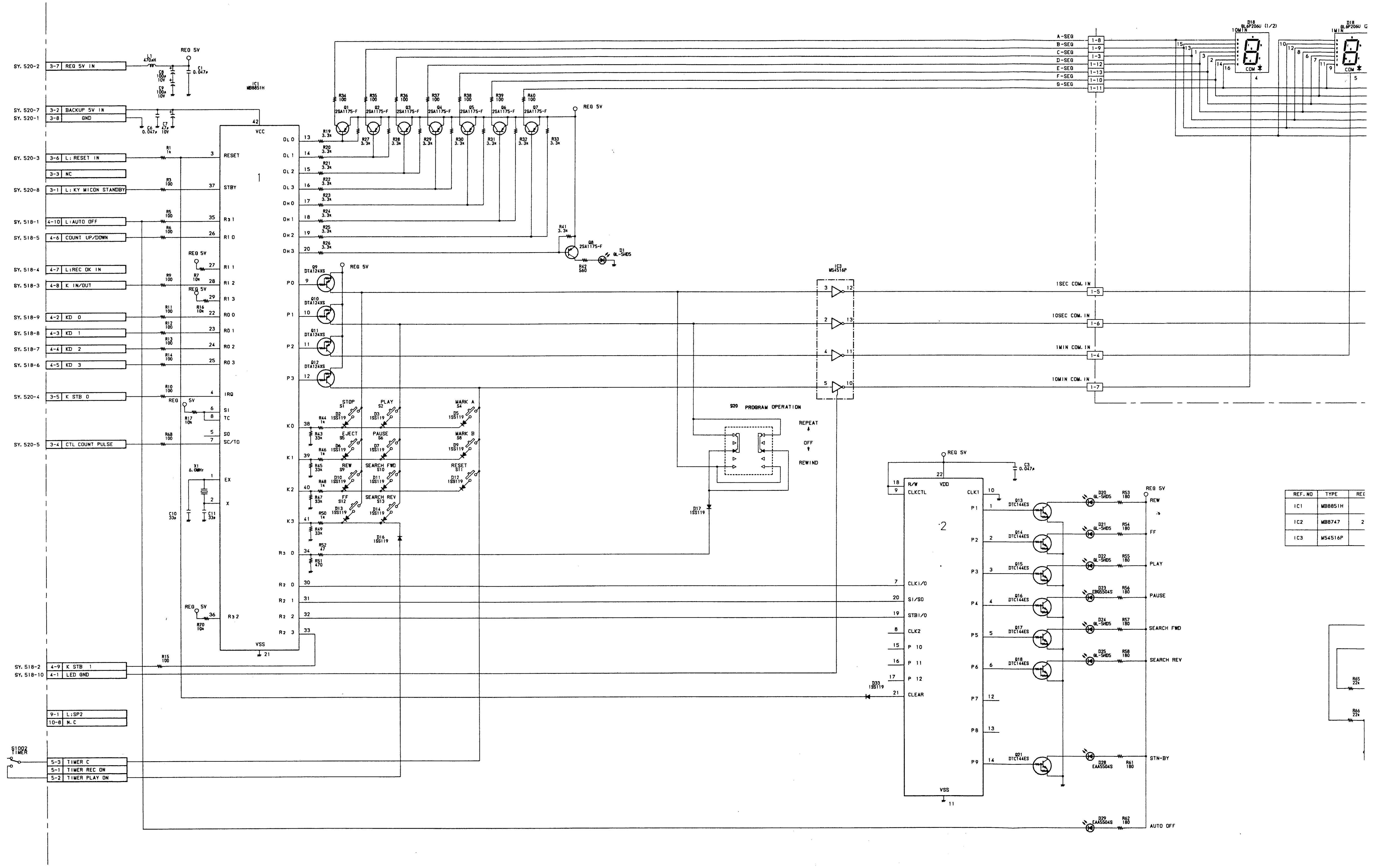
CN701	C - 1
CN702	A - 3
CN703	B - 3
CN704	C - 3
CN705	F - 3
CN706	F - 3
CN707	M - 1
CN708	M - 1
CN710	P - 1
D1	D - 1
D2	L - 3
D3	J - 3
D5	E - 2
D6	K - 2
D7	G - 3
D9	E - 2
D10	J - 3
D11	E - 3
D12	A - 2
D13	G - 3
D14	G - 2
D16	G - 3
D17	E - 2
D20	K - 2
D21	H - 2
D22	J - 2
D23	G - 2
D24	D - 2
D25	E - 2
D28	M - 2
D29	P - 2
D33	F - 2
IC1	C - 2
IC2	G - 1
IC3	B - 1
Q1	C - 1
Q2	C - 1
Q3	C - 1
Q4	D - 1
Q5	D - 1
Q6	C - 1
Q7	D - 1
Q8	E - 1
Q9	C - 1
Q10	C - 1
Q11	C - 1
Q12	C - 1
Q13	G - 1
Q14	G - 1
Q15	G - 1
Q16	G - 1
Q17	G - 1
Q18	H - 1
Q21	K - 1
S1	L - 3
S2	J - 3
S4	E - 1
S5	L - 2
S6	G - 3
S8	E - 2
S9	K - 3
S10	D - 3
S11	A - 2
S12	H - 3
S13	E - 3
S17	P - 3
S20	F - 1
X1	A - 2


A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
1
2
3
CN701
CN702
CN703
CN704
CN705
CN706
CN707
CN708
CN710
IC1
IC2
IC3
S11 RESET
S4 MARK A
S8 MARK B
S20 PROGRAMMED OPERATION
OFF
A
S5 EJECT
S17 AUDIO MONITOR
CH2
MIX
CH1
S10 SEARCH FWD
S13 SEARCH REV
S6 PAUSE
S12 FF
S2 PLAY
S9 REW
S1 STOP
Q21
X1
L1

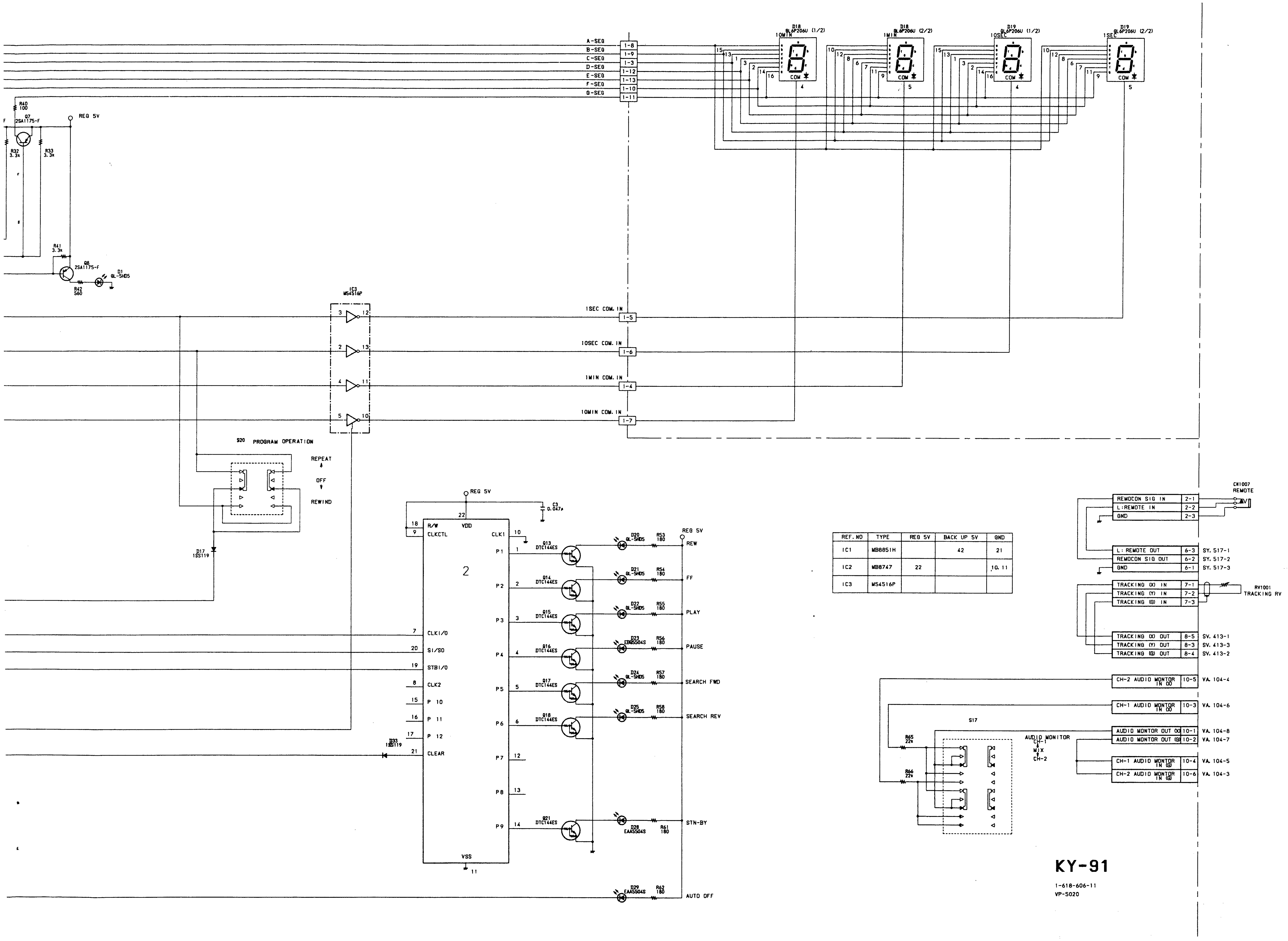
KY-91 —SOLDERING SIDE—
1-618-606-11
VP-5020



KY-91 ; FUNCTION KEY AND DISPLAY


SY. 520-2
3-7 REG 5V IN
SY. 520-7
3-2 BACKUP 5V IN
SY. 520-1
3-8 GND
SY. 520-3
3-6 L: RESET IN
3-3 NC
SY. 520-8
3-1 L: KY MICON STANDBY
SY. 518-1
4-10 L: AUTO OFF
SY. 518-5
4-6 COUNT UP/DOWN
SY. 518-4
4-7 L: REC OK IN
SY. 518-3
4-8 K IN/OUT
SY. 518-9
4-2 KD 0
SY. 518-8
4-3 KD 1
SY. 518-7
4-4 KD 2
SY. 518-6
4-5 KD 3
SY. 520-4
3-5 K STB 0
SY. 520-5
3-4 CTL COUNT PULSE
SY. 518-2
4-9 K STB 1
SY. 518-10
4-1 LED GND
9-1 L: SP2
10-8 N.C
S1002 TIMER
5-3 TIMER C
5-1 TIMER REC ON
5-2 TIMER PLAY ON
REG 5V
L1 470μH
C1 0.047μ
C8 100μ 10V
C9 100μ 10V
C6 0.047μ
C7 47μ 10V
IC1 MB8851H
1
VCC
RESET
STBY
R3 1
R1 0
R1 1
R1 2
R1 3
R0 0
R0 1
R0 2
R0 3
IRQ
SI
TC
SO
SC/TO
EX
X
X1 6.0MHz
C10 33p
C11 33p
R3 2
VSS
OL 0
OL 1
OL 2
OL 3
OH 0
OH 1
OH 2
OH 3
P0
P1
P2
P3
K0
K1
K2
K3
R3 0
R2 0
R2 1
R2 2
R2 3
Q1–Q7 2SA1175-F
Q8 2SA1175-F
D1 GL-5HD5
Q9 DTA124XS
Q10 DTA124XS
Q11 DTA124XS
Q12 DTA124XS
STOP S1
PLAY S2
MARK A S4
EJECT S5
PAUSE S6
MARK B S8
REW S9
SEARCH FWD S10
RESET S11
FF S12
SEARCH REV S13
1SS119
D16 1SS119
IC3 M54516P
S20 PROGRAM OPERATION
REPEAT
OFF
REWIND
D17 1SS119
A-SEG
B-SEG
C-SEG
D-SEG
E-SEG
F-SEG
G-SEG
1-8
1-9
1-3
1-12
1-13
1-10
1-11
1SEC COM. IN
1-5
10SEC COM. IN
1-6
1MIN COM. IN
1-4
10MIN COM. IN
1-7
D18 BL6P206U (1/2)
10MIN
1MIN
COM
IC2
R/W
CLKCTL
VDD
CLK1
CLK I/O
SI/SO
STB I/O
CLK2
P 10
P 11
P 12
CLEAR
D33 1SS119
C3 0.047μ
VSS
Q13–Q18 DTC144ES
Q21 DTC144ES
D20 GL-5HD5
D21 GL-5HD5
D22 GL-5HD5
D23 EBG5504S
D24 GL-5HD5
D25 GL-5HD5
D28 EAA5504S
D29 EAA5504S
R53–R58 180
R61 180
R62 180
REW
FF
PLAY
PAUSE
SEARCH FWD
SEARCH REV
STN-BY
AUTO OFF
R65 22k
R66 22k

REF. NO	TYPE	RE
IC1	MB8851H	
IC2	MB8747	2
IC3	M54516P	


D18 BL6P206U (1/2)
10MIN
D18 BL6P206U (2/2)
1MIN
D19 BL6P206U (1/2)
10SEC
D19 BL6P206U (2/2)
1SEC
COM
A-SEG
B-SEG
C-SEG
D-SEG
E-SEG
F-SEG
G-SEG
1-8
1-9
1-3
1-12
1-13
1-10
1-11
R40 100
Q7 2SA1175-F
REG 5V
R32 3.3k
R33 3.3k
R41 3.3k
Q6 2SA1175-F
D1 GL-5HD5
R42 560
IC3 M54516P
1SEC COM. IN
1-5
10SEC COM. IN
1-6
1MIN COM. IN
1-4
10MIN COM. IN
1-7
S20 PROGRAM OPERATION
REPEAT
OFF
REWIND
D17 1SS119
REG 5V
C3 0.047μ
R/W
CLKCTL
VDD
CLK1
P1
P2
P3
P4
P5
P6
P7
P8
P9
CLKI/O
SI/SO
STBI/O
CLK2
P 10
P 11
P 12
CLEAR
VSS
D33 1SS119
Q13 DTC144ES
Q14 DTC144ES
Q15 DTC144ES
Q16 DTC144ES
Q17 DTC144ES
Q18 DTC144ES
Q21 DTC144ES
D20 GL-5HD5
D21 GL-5HD5
D22 GL-5HD5
D23 EBG5504S
D24 GL-5HD5
D25 GL-5HD5
D28 EAA5504S
D29 EAA5504S
R53 180
R54 180
R55 180
R56 180
R57 180
R58 180
R61 180
R62 180
REG 5V
REW
FF
PLAY
PAUSE
SEARCH FWD
SEARCH REV
STN-BY
AUTO OFF
CN1007
REMOTE
REMOCON SIG IN
L:REMOTE IN
GND
2-1
2-2
2-3
L: REMOTE OUT
REMOCON SIG OUT
GND
6-3
6-2
6-1
SY. 517-1
SY. 517-2
SY. 517-3
TRACKING (X) IN
TRACKING (Y) IN
TRACKING (G) IN
7-1
7-2
7-3
RV1001
TRACKING RV
TRACKING (X) OUT
TRACKING (Y) OUT
TRACKING (G) OUT
8-5
8-3
8-4
SV. 413-1
SV. 413-3
SV. 413-2
CH-2 AUDIO MONTOR IN (X)
10-5
VA. 104-4
CH-1 AUDIO MONTOR IN (X)
10-3
VA. 104-6
S17
AUDIO MONITOR
CH-1
MIX
CH-2
R65 22k
R66 22k
AUDIO MONTOR OUT (X)
AUDIO MONTOR OUT (G)
10-1
10-2
VA. 104-8
VA. 104-7
CH-1 AUDIO MONTOR IN (G)
CH-2 AUDIO MONTOR IN (G)
10-4
10-6
VA. 104-5
VA. 104-3

REF.NO	TYPE	REG 5V	BACK UP 5V	GND
IC1	MB8851H		42	21
IC2	MB8747	22		10, 11
IC3	M54516P			

KY-91

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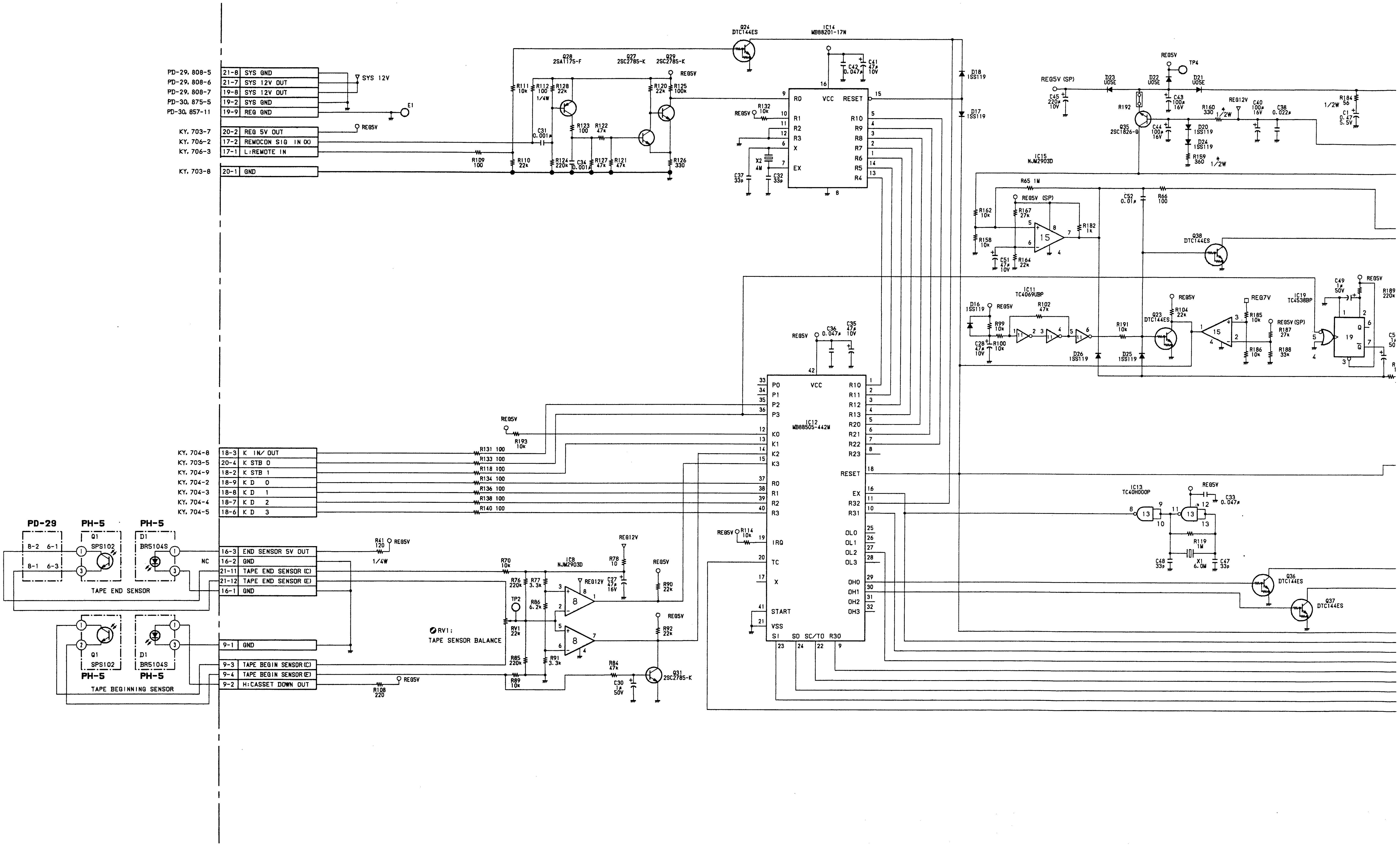
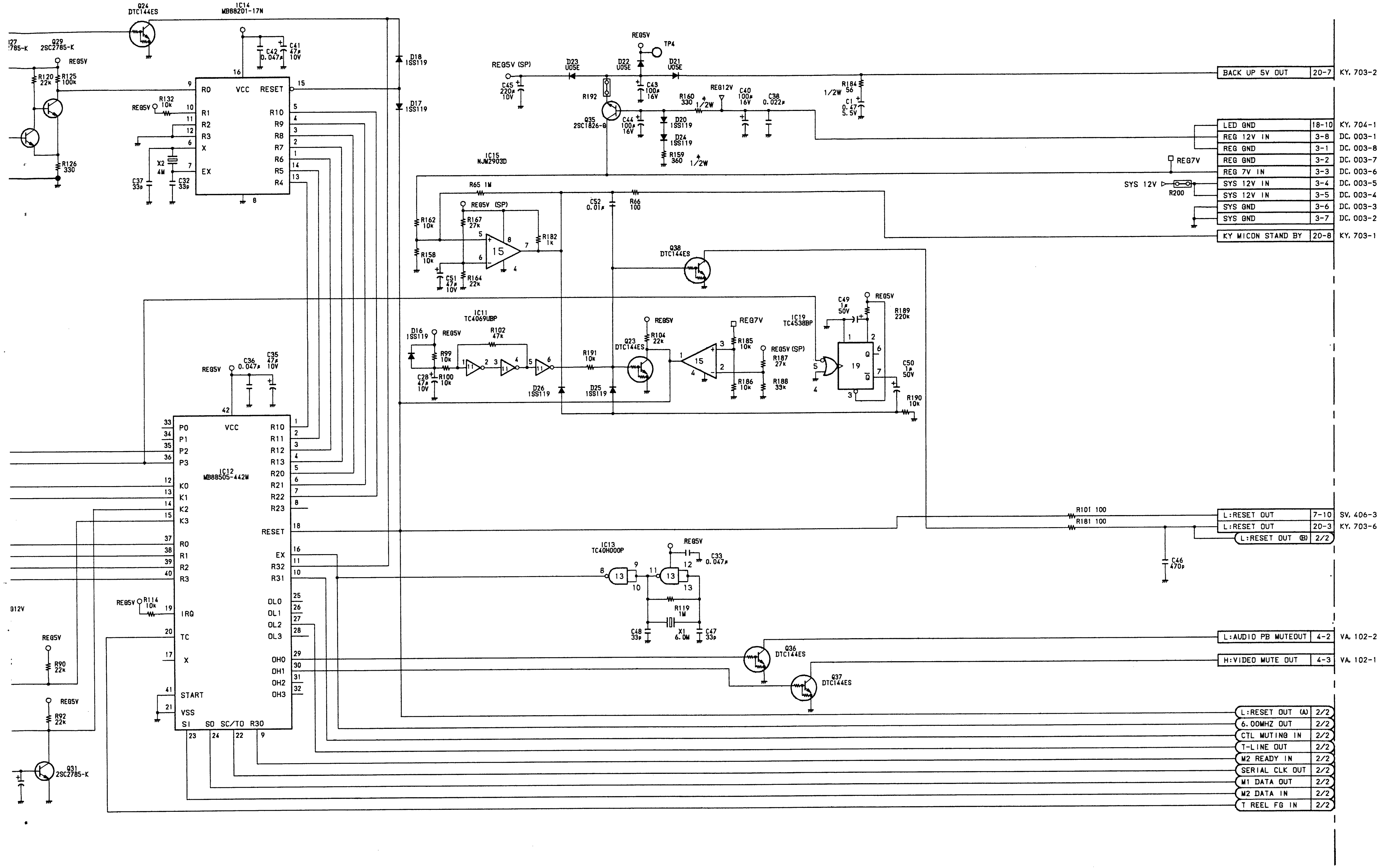
VP-5020

SY-51 (1/2) ; SYSTEM CONTROL


PD-29, 808-5
PD-29, 808-6
PD-29, 808-7
PD-30, 875-5
PD-30, 857-11
21-8 SYS GND
21-7 SYS 12V OUT
19-8 SYS 12V OUT
19-2 SYS GND
19-9 REG GND
SYS 12V
E1
KY, 703-7
KY, 706-2
KY, 706-3
KY, 703-8
20-2 REG 5V OUT
17-2 REMOCON SIG IN (X)
17-1 L:REMOTE IN
20-1 GND
REG5V
Q28 2SA1175-F
Q27 2SC2785-K
Q29 2SC2785-K
Q24 DTC144ES
IC14 MB88201-17N
R111 10k
R112 100 1/4W
R128 22k
R120 22k
R125 100k
C31 0.001μ
R123 100
R122 47k
R109 100
R110 22k
R124 220k
C34 0.001μ
R127 47k
R121 47k
R126 330
R132 10k
X2 4M
C37 33p
C32 33p
C42 0.047μ
C41 47μ 10V
RO
VCC
RESET
R1
R2
R3
X
EX
R10
R9
R8
R7
R6
R5
R4
D18 1SS119
D17 1SS119
REG5V (SP)
C45 220μ 10V
D23 U05E
D22 U05E
D21 U05E
TP4
R192
C43 100μ 16V
R160 330 1/2W
REG12V
C40 100μ 16V
C38 0.022μ
R184 56 1/2W
C1 0.47 5.5V
Q35 2SC1826-Q
C44 100μ 16V
D20 1SS119
D24 1SS119
R159 360 1/2W
IC15 NJM2903D
R65 1M
R162 10k
R167 27k
R158 10k
C51 47μ 10V
R164 22k
R182 1k
C52 0.01μ
R66 100
Q38 DTC144ES
IC11 TC4069UBP
D16 1SS119
R99 10k
R102 47k
C28 47μ 10V
R100 10k
D26 1SS119
R191 10k
D25 1SS119
Q23 DTC144ES
R104 22k
REG7V
R185 10k
R187 27k
R186 10k
R188 33k
C49 1μ 50V
R189 220k
IC19 TC4538BP
C36 0.047μ
C35 47μ 10V
IC12 MB88505-442M
P0
P1
P2
P3
K0
K1
K2
K3
R0
R1
R2
R3
R11
R12
R13
R20
R21
R22
R23
R32
R31
IRQ
TC
OL0
OL1
OL2
OL3
OH0
OH1
OH2
OH3
START
VSS
SI
SO
SC/TO
R30
R193 10k
R114 10k
IC13 TC40H000P
C33 0.047μ
R119 1M
C48 33p
X1 6.0M
C47 33p
Q36 DTC144ES
Q37 DTC144ES
KY, 704-8
KY, 703-5
KY, 704-9
KY, 704-2
KY, 704-3
KY, 704-4
KY, 704-5
18-3 K IN/OUT
20-4 K STB 0
18-2 K STB 1
18-9 K D 0
18-8 K D 1
18-7 K D 2
18-6 K D 3
R131 100
R133 100
R118 100
R134 100
R136 100
R138 100
R140 100
PD-29
PH-5
8-2 6-1
8-1 6-3
Q1 SPS102
D1 BR5104S
NC
TAPE END SENSOR
16-3 END SENSOR 5V OUT
16-2 GND
21-11 TAPE END SENSOR (C)
21-12 TAPE END SENSOR (E)
16-1 GND
R41 120 1/4W
R70 10k
IC8 NJM2903D
R78 10
REG12V
C27 47μ 16V
R76 220k
R77 3.3k
TP2
R86 6.2k
RV1 22k
RV1: TAPE SENSOR BALANCE
R90 22k
R92 22k
R85 220k
R91 3.3k
R89 10k
R84 47k
C30 1μ 50V
Q31 2SC2785-K
9-1 GND
9-3 TAPE BEGIN SENSOR (C)
9-4 TAPE BEGIN SENSOR (E)
9-2 H:CASSET DOWN OUT
R108 220
TAPE BEGINNING SENSOR


Q24 DTC144ES
IC14 MB88201-17N
Q29 2SC2785-K
REG5V
R120 22k
R125 100k
R132 10k
R126 330
X2 4M
C37 33p
C32 33p
C42 0.047μ
C41 47μ 10V
RO
VCC
RESET
R1
R2
R3
X
EX
R10
R9
R8
R7
R6
R5
R4
D18 1SS119
D17 1SS119
REG5V (SP)
C45 220μ 10V
D23 U05E
D22 U05E
D21 U05E
TP4
R192
Q35 2SC1826-Q
C43 100μ 16V
C44 100μ 16V
D20 1SS119
D24 1SS119
R159 360 1/2W
R160 330 1/2W
REG12V
C40 100μ 16V
C38 0.022μ
R184 56 1/2W
C1 0.47 5.5V
IC15 NJM2903D
R65 1M
REG5V (SP)
R162 10k
R167 27k
R182 1k
R158 10k
C51 47μ 10V
R164 22k
C52 0.01μ
R66 100
Q38 DTC144ES
BACK UP 5V OUT 20-7 KY. 703-2
LED GND 18-10 KY. 704-1
REG 12V IN 3-8 DC. 003-1
REG GND 3-1 DC. 003-8
REG GND 3-2 DC. 003-7
REG 7V IN 3-3 DC. 003-6
SYS 12V IN 3-4 DC. 003-5
SYS 12V IN 3-5 DC. 003-4
SYS GND 3-6 DC. 003-3
SYS GND 3-7 DC. 003-2
KY MICON STAND BY 20-8 KY. 703-1
REG7V
SYS 12V
R200
IC11 TC4069UBP
D16 1SS119
R99 10k
R102 47k
C28 47μ 10V
R100 10k
D26 1SS119
R191 10k
D25 1SS119
Q23 DTC144ES
R104 22k
REG7V
R185 10k
R186 10k
R187 27k
R188 33k
IC19 TC4538BP
C49 1μ 50V
R189 220k
C50 1μ 50V
R190 10k
C36 0.047μ
C35 47μ 10V
IC12 MB88505-442M
PO
P1
P2
P3
KO
K1
K2
K3
RO
R1
R2
R3
IRQ
TC
X
START
VSS
SI
SO
SC/TO
R30
R10
R11
R12
R13
R20
R21
R22
R23
RESET
EX
R32
R31
OLO
OL1
OL2
OL3
OHO
OH1
OH2
OH3
R114 10k
R90 22k
R92 22k
Q31 2SC2785-K
R101 100
R181 100
L:RESET OUT 7-10 SV. 406-3
L:RESET OUT 20-3 KY. 703-6
L:RESET OUT (B) 2/2
C46 470p
IC13 TC40H000P
C33 0.047μ
R119 1M
X1 6.0M
C48 33p
C47 33p
Q36 DTC144ES
Q37 DTC144ES
L:AUDIO PB MUTEOUT 4-2 VA. 102-2
H:VIDEO MUTE OUT 4-3 VA. 102-1
L:RESET OUT (A) 2/2
6.00MHZ OUT 2/2
CTL MUTING IN 2/2
T-LINE OUT 2/2
M2 READY IN 2/2
SERIAL CLK OUT 2/2
M1 DATA OUT 2/2
M2 DATA IN 2/2
T REEL FG IN 2/2

NOTE:

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

SY-51 (1/2)

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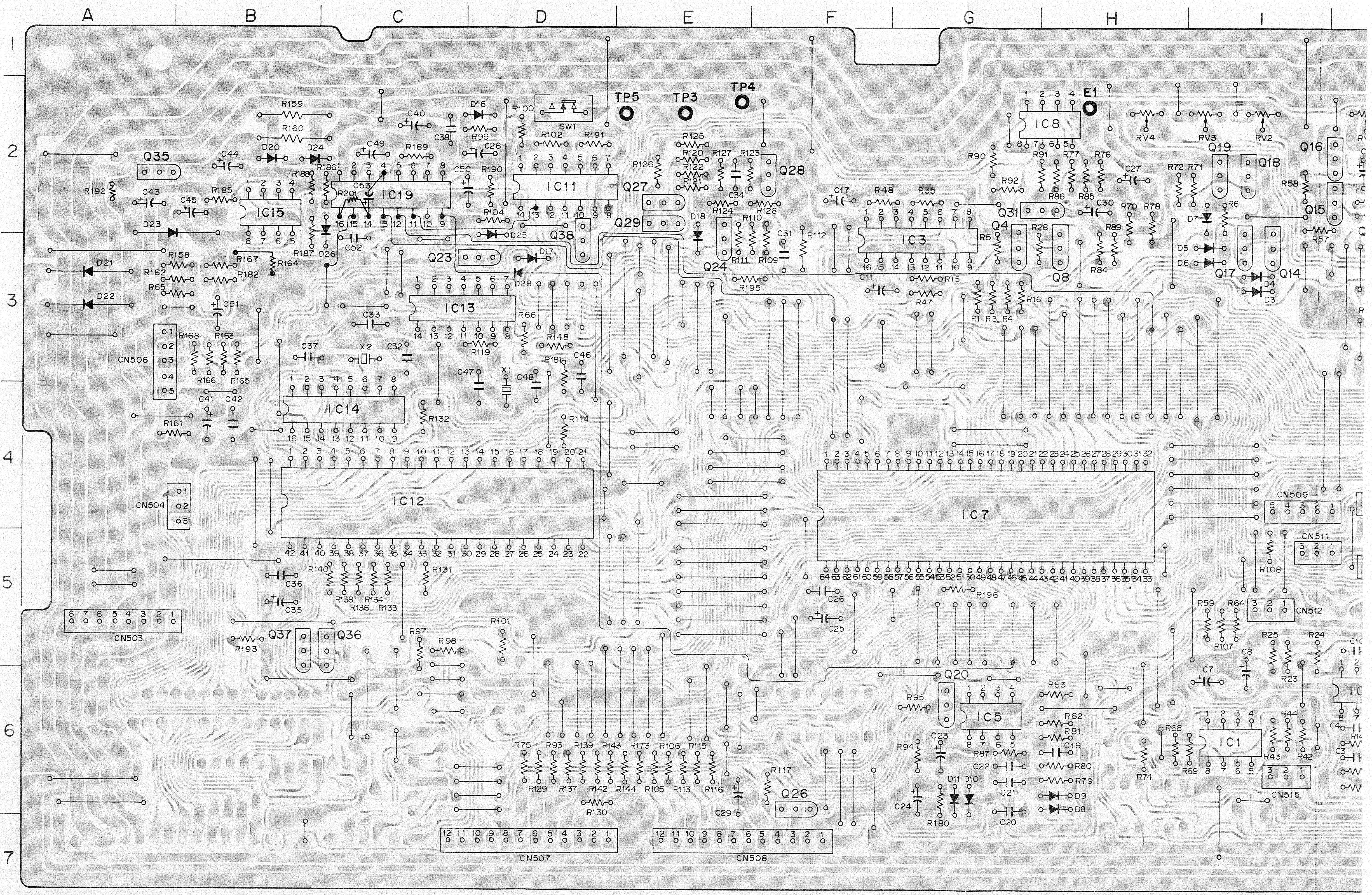
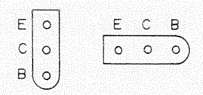
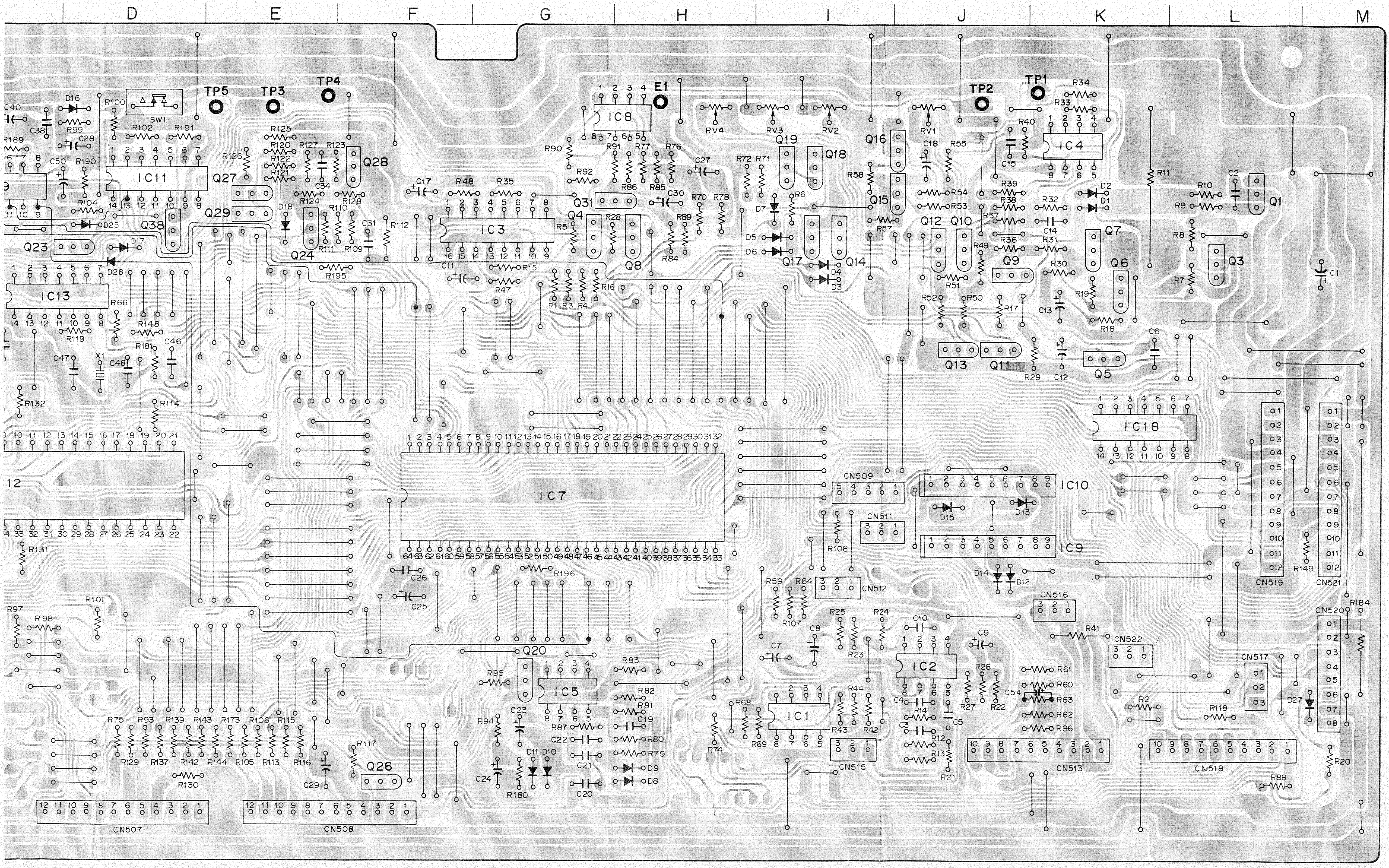
VP-5020
VP-5040

SY-51 ; SYSTEM CONTROL

CN503	A - 5
CN504	B - 4
CN506	A - 3
CN507	D - 7
CN508	F - 7
CN509	I - 4
CN511	I - 5
CN512	I - 5
CN513	K - 6
CN515	I - 6
CN516	K - 5
CN517	L - 6
CN518	L - 6
CN519	L - 4
CN520	M - 6
CN521	M - 4
CN522	K - 6
D1	K - 2
D2	K - 2
D3	I - 3
D4	I - 3
D5	I - 3
D6	I - 3
D7	I - 2
D8	H - 6
D9	H - 6
D10	G - 6
D11	G - 6
D12	J - 5
D13	J - 4
D14	J - 5
D15	J - 4
D16	D - 2
D17	D - 3
D18	E - 2
D20	B - 2
D21	A - 3
D22	A - 3
D23	A - 2
D24	B - 2
D25	D - 2
D26	C - 2
D27	M - 6
D28	D - 3
E1	H - 2
IC1	I - 6
IC2	J - 6
IC3	G - 2
IC4	K - 2
IC5	G - 6
IC7	G - 4
IC8	H - 2
IC9	J - 5
IC10	J - 4
IC11	D - 2
IC12	C - 4
IC13	C - 3
IC14	C - 4
IC15	B - 2
IC18	K - 4
IC19	C - 2
Q1	L - 2
Q3	L - 3
Q4	G - 2
Q5	K - 3
Q6	K - 3
Q7	K - 3
Q8	H - 3
Q9	J - 3
Q10	J - 3
Q11	J - 3
Q12	J - 3
Q13	J - 3
Q14	J - 3
Q15	J - 2
Q16	J - 2
Q17	I - 3
Q18	I - 2
Q19	I - 2
Q20	G - 6
Q23	D - 3
Q24	E - 2
Q26	F - 6
Q27	E - 2
Q28	F - 2
Q29	E - 2
Q31	G - 2
Q35	A - 2
Q36	C - 5
Q37	B - 5
Q38	D - 2
RV1	J - 2
RV2	I - 2
RV3	I - 2
RV4	H - 2
SW1	D - 2
TP1	K - 2
TP2	J - 2
TP3	E - 2
TP4	E - 2
TP5	E - 2
X1	D - 3
X2	C - 3


A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
TP5
TP3
TP4
E1
SW1
IC8
IC11
IC15
IC19
IC13
IC14
IC12
IC7
IC3
IC5
IC1
Q35
Q27
Q28
Q29
Q38
Q23
Q24
Q31
Q4
Q8
Q19
Q18
Q16
Q15
Q17
Q14
Q20
Q26
Q37
Q36
CN503
CN504
CN506
CN507
CN508
CN509
CN511
CN512
CN515
RV4
RV3
RV2
X1
X2




D
E
F
G
H
I
J
K
L
M
TP1
TP2
TP3
TP4
TP5
E1
SW1
IC1
IC2
IC3
IC4
IC5
IC7
IC8
IC9
IC10
IC11
IC13
IC18
Q1
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
Q23
Q24
Q26
Q27
Q28
Q29
Q31
Q38
RV1
RV2
RV3
RV4
X1
CN507
CN508
CN509
CN511
CN512
CN513
CN515
CN516
CN517
CN518
CN519
CN520
CN521
CN522

SY-51 —SOLDERING SIDE—

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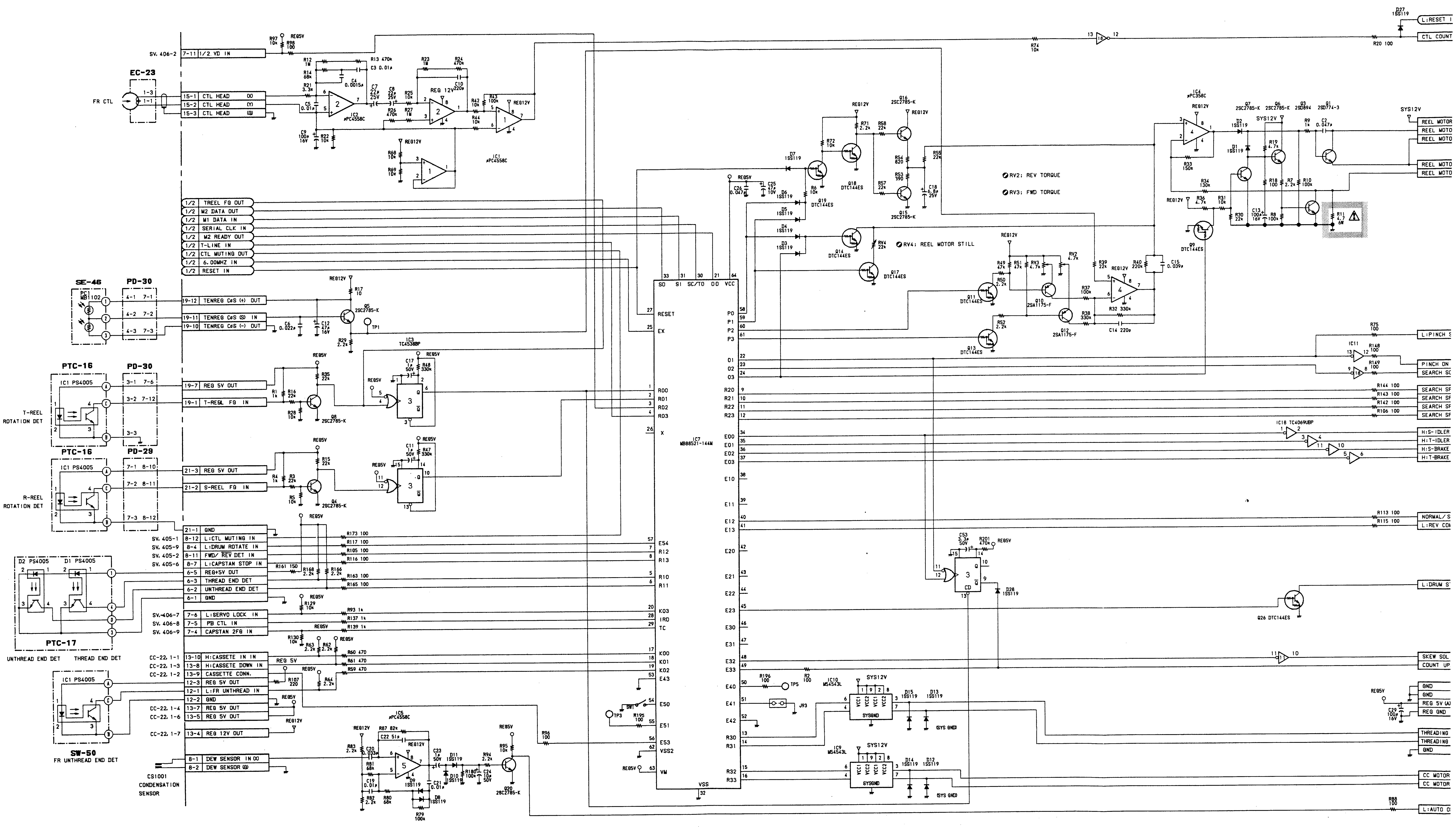
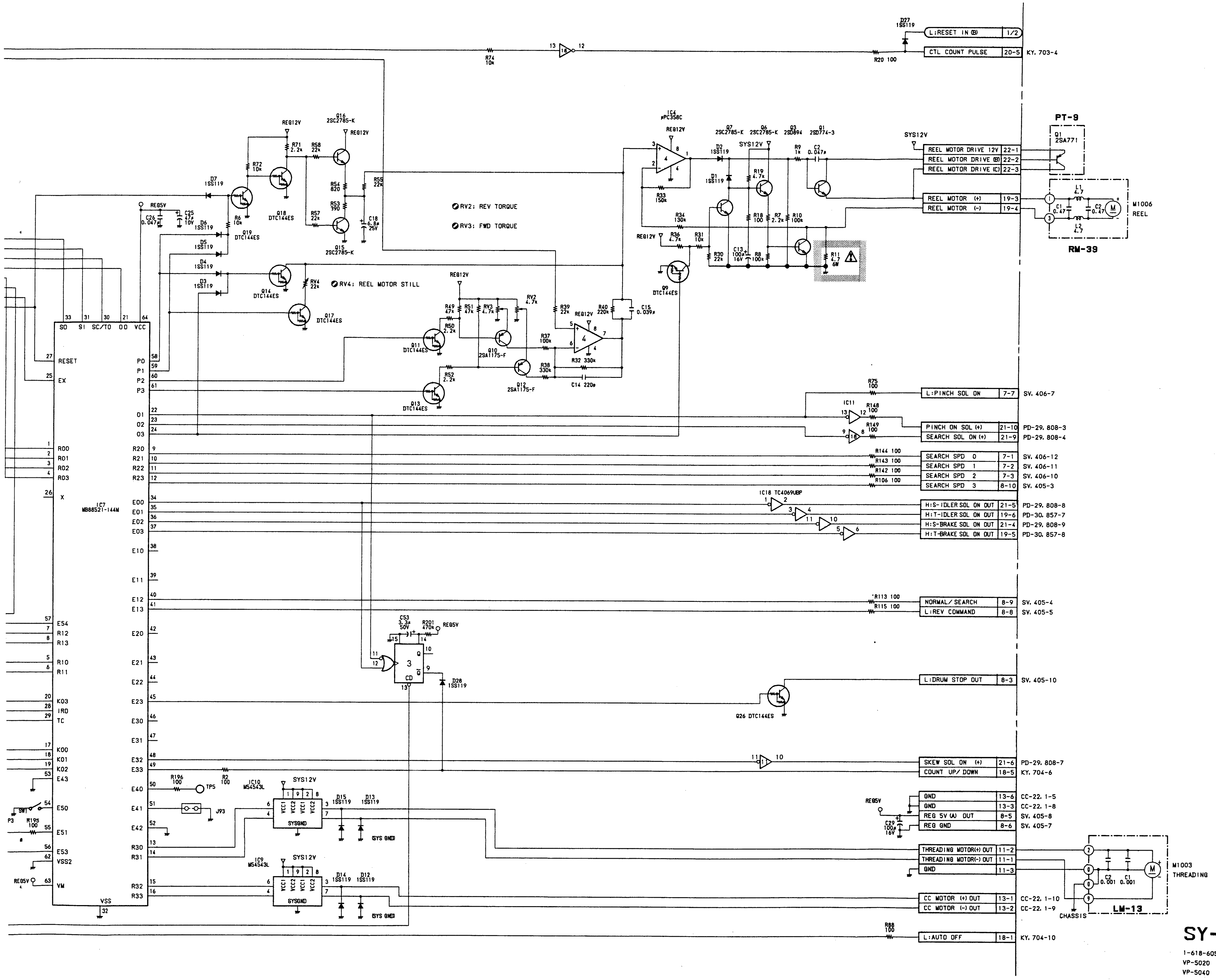
VP-5020

VP-5040

SY-51 (2/2) ; SYSTEM CONTROL


EC-23
FR CTL
SV. 406-2
1/2 VD IN
CTL HEAD
SE-46
PD-30
PTC-16
PD-29
PTC-17
SW-50
T-REEL ROTATION DET
R-REEL ROTATION DET
UNTHREAD END DET
THREAD END DET
FR UNTHREAD END DET
CS1001 CONDENSATION SENSOR
TREEL FG OUT
M2 DATA OUT
M1 DATA IN
SERIAL CLK IN
M2 READY OUT
T-LINE IN
CTL MUTING OUT
6.00MHZ IN
RESET IN
TENREG C≠S (+) OUT
TENREG C≠S (S) IN
TENREG C≠S (-) OUT
REG 5V OUT
T-REGL FG IN
S-REEL FG IN
GND
L:CTL MUTING IN
L:DRUM ROTATE IN
FWD/ REV DET IN
L:CAPSTAN STOP IN
REG+5V OUT
THREAD END DET
UNTHREAD END DET
L:SERVO LOCK IN
PB CTL IN
CAPSTAN 2FG IN
H:CASSETE IN IN
H:CASSETE DOWN IN
CASSETTE CONN.
L:FR UNTHREAD IN
REG 12V OUT
DEW SENSOR IN
DEW SENSOR
IC1 μPC4558C
IC2 μPC4558C
IC3 TC4538BP
IC4 μPC358C
IC5 μPC4558C
IC7 MB88521-144M
IC9 M54543L
IC10 M54543L
IC11
IC18 TC4069UBP
REG5V
REG12V
SYS12V
RV2: REV TORQUE
RV3: FWD TORQUE
RV4: REEL MOTOR STILL
L:RESET I
CTL COUNT
REEL MOTOR
L:PINCH S
PINCH ON
SEARCH SE
SEARCH SF
H:S-IDLER
H:T-IDLER
H:S-BRAKE
H:T-BRAKE
NORMAL/ S
L:REV CO
L:DRUM S
SKEW SOL
COUNT UP
REG 5V
REG GND
THREADING
CC MOTOR
L:AUTO
SYS GND


D27 1SS119
L:RESET IN (B) 1/2
CTL COUNT PULSE 20-5 KY. 703-4
R20 100
R74 10k
IC4 μPC358C
REG12V
Q16 2SC2785-K
Q7 2SC2785-K
Q6 2SC2785-K
Q3 2SD894
Q1 2SD774-3
SYS12V
REEL MOTOR DRIVE 12V 22-1
REEL MOTOR DRIVE (B) 22-2
REEL MOTOR DRIVE (C) 22-3
PT-9
Q1 2SA771
REEL MOTOR (+) 19-3
REEL MOTOR (−) 19-4
L1 4.7
C1 0.47
C2 0.47
L2 4.7
M1006 REEL
RM-39
RV2: REV TORQUE
RV3: FWD TORQUE
RV4: REEL MOTOR STILL
REG5V
Q18 DTC144ES
Q19 DTC144ES
Q14 DTC144ES
Q17 DTC144ES
Q15 2SC2785-K
Q9 DTC144ES
Q11 DTC144ES
Q10 2SA1175-F
Q12 2SA1175-F
Q13 DTC144ES
R11 4.7 6W
IC7 MB88521-144M
RESET
EX
SO SI SC/TO OO VCC
P0 P1 P2 P3
O1 O2 O3
R00 R01 R02 R03
R20 R21 R22 R23
X
E00 E01 E02 E03
E10 E11 E12 E13
E20 E21 E22 E23
E30 E31 E32 E33
E40 E41 E42
E54 R12 R13 R10 R11
K03 IRD TC
K00 K01 K02 E43
E50 E51 E53 VSS2 VM
R30 R31 R32 R33
VSS
SW1
R195 100
R196 100
TP5
J93
R2 100
IC10 M54543L
IC9 M54543L
SYS12V
SYSGND
D15 1SS119
D13 1SS119
D14 1SS119
D12 1SS119
SYS GND
L:PINCH SOL ON 7-7 SV. 406-7
R75 100
IC11
R148 100
R149 100
PINCH ON SOL (+) 21-10 PD-29. 808-3
SEARCH SOL ON (+) 21-9 PD-29. 808-4
R144 100
R143 100
R142 100
R106 100
SEARCH SPD 0 7-1 SV. 406-12
SEARCH SPD 1 7-2 SV. 406-11
SEARCH SPD 2 7-3 SV. 406-10
SEARCH SPD 3 8-10 SV. 405-3
IC18 TC4069UBP
H:S-IDLER SOL ON OUT 21-5 PD-29. 808-8
H:T-IDLER SOL ON OUT 19-6 PD-30. 857-7
H:S-BRAKE SOL ON OUT 21-4 PD-29. 808-9
H:T-BRAKE SOL ON OUT 19-5 PD-30. 857-8
R113 100
R115 100
NORMAL/ SEARCH 8-9 SV. 405-4
L:REV COMMAND 8-8 SV. 405-5
C53 3.3μ 50V
R201 470k
D28 1SS119
L:DRUM STOP OUT 8-3 SV. 405-10
Q26 DTC144ES
SKEW SOL ON (+) 21-6 PD-29. 808-7
COUNT UP/ DOWN 18-5 KY. 704-6
REG5V
C29 100μ 16V
GND 13-6 CC-22. 1-5
GND 13-3 CC-22. 1-8
REG 5V (A) OUT 8-5 SV. 405-8
REG GND 8-6 SV. 405-7
THREADING MOTOR(+) OUT 11-2
THREADING MOTOR(−) OUT 11-1
GND 11-3
C2 0.001
C1 0.001
M1003 THREADING
CC MOTOR (+) OUT 13-1 CC-22. 1-10
CC MOTOR (−) OUT 13-2 CC-22. 1-9
CHASSIS
LM-13
R88 100
L:AUTO OFF 18-1 KY. 704-10

Ref. NO.	TYPE	REG12V	REG5V	SYS12V	REG 5V (SP)	GND
IC1	UPC4558C	8				4
IC2	UPC4558C	8				4
IC3	TC4538BP		3. 5 11.13			1 15
IC4	UPC358C	8				4
IC5	UPC4558C	8				4
IC6	—					
IC7	MB88521 -144M		6364			52,53 62,32
IC8	NJM2903D	8			4	
IC9	M54543L			1 ,2 8 .9		
IC10	M54543L			1 ,2 8 .9		
IC11	TC4069UBP					
IC12	MB88505 -442M		42			21 41
IC13	TC40H000P					
IC14	MB882001 -17N		16			8 11 12
IC15	NJM2903D				8	4
IC16	—					
IC17	—					
IC18	TC4069UBP					
IC19	TC4538BP		3			1 4
IC20	—					

SW1　ON : TEST MODE
　　　OFF : NORMAL MODE

J93	TP5	LONG PAUSE
0	1	8 MIN
1	1	1 MIN
1	0	10 SEC
0	0	2 SEC

SY-51 (2/2)

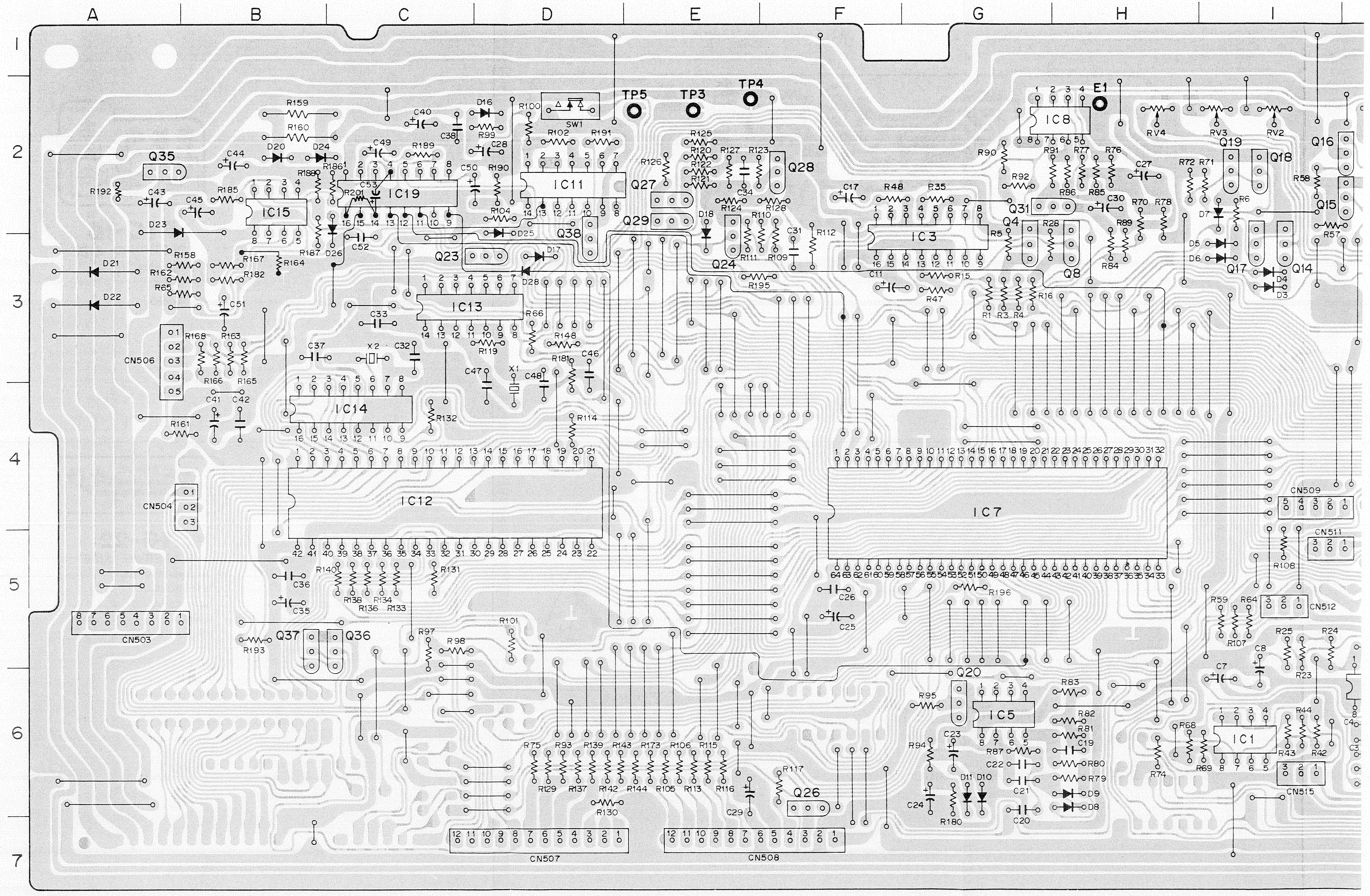
1-618-605-11
VP-5020
VP-5040

NOTE:

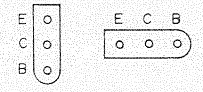
The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

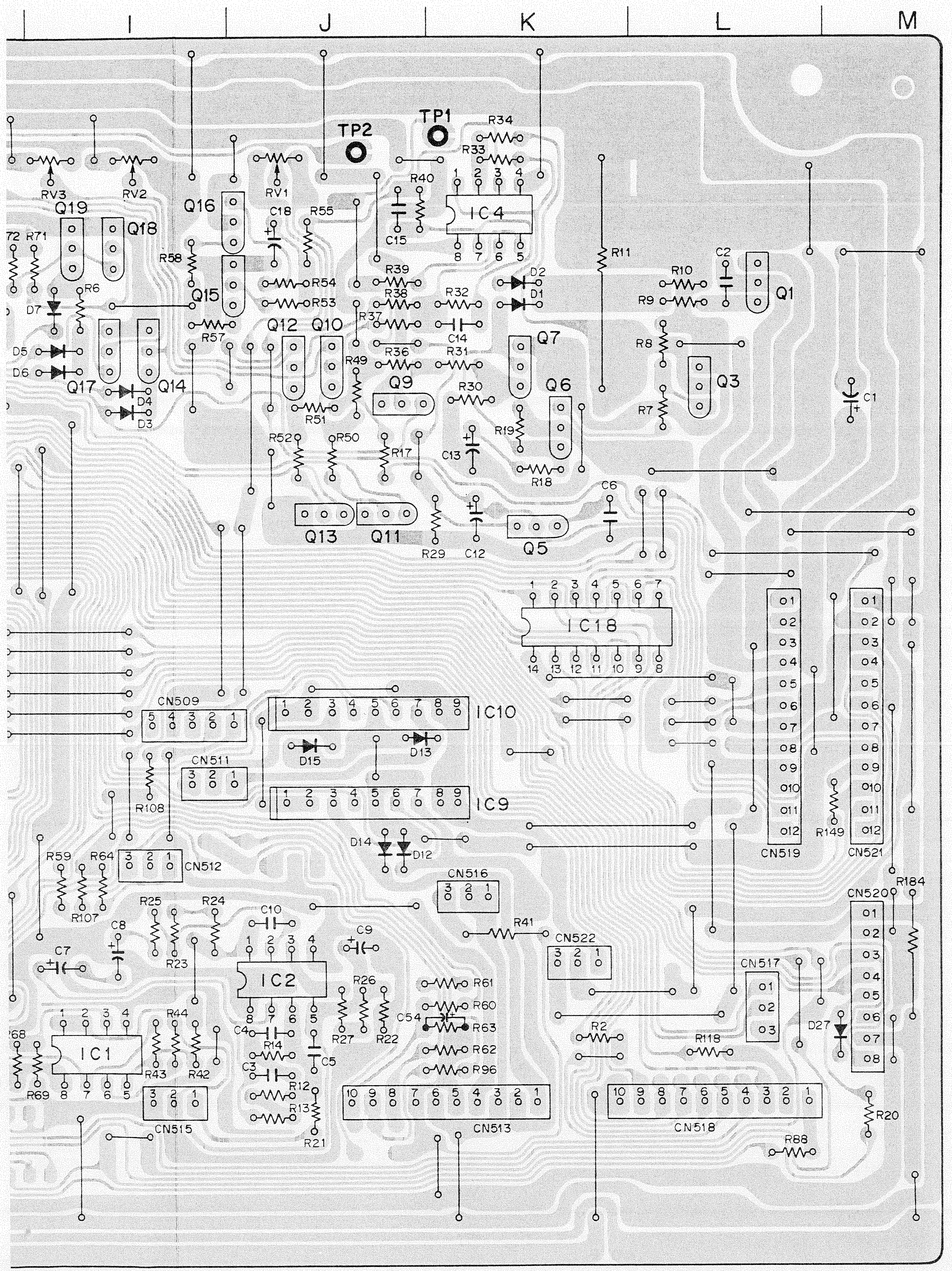
SY-51 ; SYSTEM CONTROL

CN503	A - 5
CN504	B - 4
CN506	A - 3
CN507	D - 7
CN508	F - 7
CN509	I - 4
CN511	I - 5
CN512	I - 5
CN513	K - 6
CN515	I - 6
CN516	K - 5
CN517	L - 6
CN518	L - 6
CN519	L - 4
CN520	M - 6
CN521	M - 4
CN522	K - 6
D1	K - 2
D2	K - 2
D3	I - 3
D4	I - 3
D5	I - 3
D6	I - 3
D7	I - 2
D8	H - 6
D9	H - 6
D10	G - 6
D11	G - 6
D12	J - 5
D13	J - 4
D14	J - 5
D15	J - 4
D16	D - 2
D17	D - 3
D18	E - 2
D20	B - 2
D21	A - 3
D22	A - 3
D23	A - 2
D24	B - 2
D25	D - 2
D26	C - 2
D27	M - 6
D28	D - 3
E1	H - 2
IC1	I - 6
IC2	J - 6
IC3	G - 2
IC4	K - 2
IC5	G - 6
IC7	G - 4
IC8	H - 2
IC9	J - 5
IC10	J - 4
IC11	D - 2
IC12	C - 4
IC13	C - 3
IC14	C - 4
IC15	B - 2
IC18	K - 4
IC19	C - 2
Q1	L - 2
Q3	L - 3
Q4	G - 2
Q5	K - 3
Q6	K - 3
Q7	K - 3
Q8	H - 3
Q9	J - 3
Q10	J - 3
Q11	J - 3
Q12	J - 3
Q13	J - 3
Q14	J - 3
Q15	J - 2
Q16	J - 2
Q17	I - 3
Q18	I - 2
Q19	I - 2
Q20	G - 6
Q23	D - 3
Q24	E - 2
Q26	F - 6
Q27	E - 2
Q28	F - 2
Q29	E - 2
Q31	G - 2
Q35	A - 2
Q36	C - 5
Q37	B - 5
Q38	D - 2
RV1	J - 2
RV2	I - 2
RV3	I - 2
RV4	H - 2
SW1	D - 2
TP1	K - 2
TP2	J - 2
TP3	E - 2
TP4	E - 2
TP5	E - 2
X1	D - 3
X2	C - 3



A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
IC15
IC19
IC11
IC13
IC14
IC12
IC3
IC8
IC7
IC5
IC1
Q35
Q37
Q36
Q23
Q38
Q27
Q29
Q24
Q28
Q31
Q4
Q8
Q19
Q18
Q16
Q15
Q17
Q14
Q20
Q26
TP5
TP3
TP4
E1
SW1
X1
X2
RV4
RV3
RV2
CN503
CN504
CN506
CN507
CN508
CN509
CN511
CN512
CN515

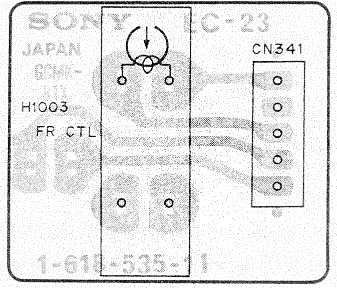



I
J
K
L
M
TP2
TP1
RV3
RV2
RV1
Q19
Q18
Q16
Q15
Q17
Q14
Q12
Q10
Q9
Q7
Q6
Q13
Q11
Q5
Q3
Q1
IC4
IC18
IC10
IC9
IC2
IC1
CN509
CN511
CN512
CN516
CN522
CN517
CN519
CN521
CN520
CN515
CN513
CN518
D1
D2
D3
D4
D5
D6
D7
D12
D13
D14
D15
D27
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C12
C13
C14
C15
C18
C54
R2
R6
R7
R8
R9
R10
R11
R12
R13
R14
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R29
R30
R31
R32
R33
R34
R36
R37
R38
R39
R40
R41
R42
R43
R44
R49
R50
R51
R52
R53
R54
R55
R57
R58
R59
R60
R61
R62
R63
R64
R69
R71
R72
R88
R96
R107
R108
R118
R149
R184

SY-51 – SOLDERING SIDE –

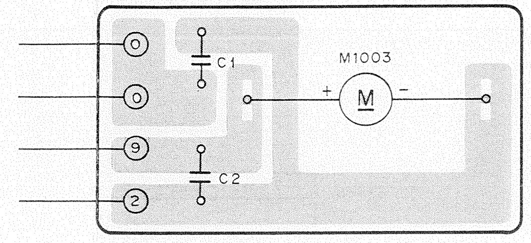
1-618-605-11
VP-5020
VP-5040

EC-23 ; FR CTL HEAD
LM-13 ; THREADING MOTOR
PT-9 ; REEL MOTOR DRIVER
PTC-17 ; THREADING DET.
SW-50 ; FR UNTHREAD END DET.


SONY
JAPAN
EC-23
CN341
H1003
FR CTL
1-618-535-11

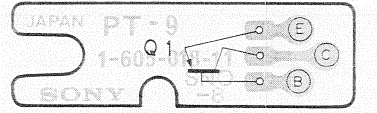
EC-23 – SOLDERING SIDE –

1-618-535-11
VP-5020
VP-5040


M1003
M
+
–
C1
C2
①
⑦
⑨
②

LM-13 – SOLDERING SIDE –

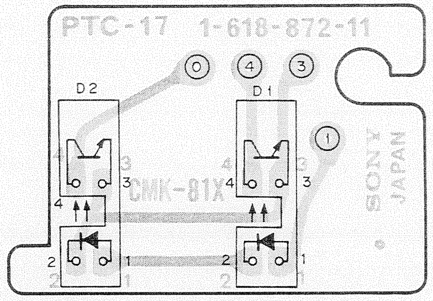
1-618-600-11
VP-5020
VP-5040


JAPAN
PT-9
Q1
SONY
E
C
B

PT-9

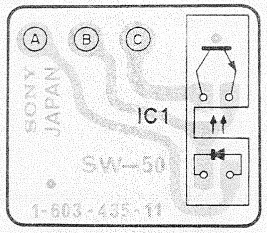
– SOLDERING SIDE –

1-605-018-11
VP-5020
VP-5040


PTC-17 1-618-872-11
D2
D1
SONY JAPAN
CMK-81X

PTC-17 – SOLDERING SIDE –

1-618-872-11
VP-5020
VP-5040

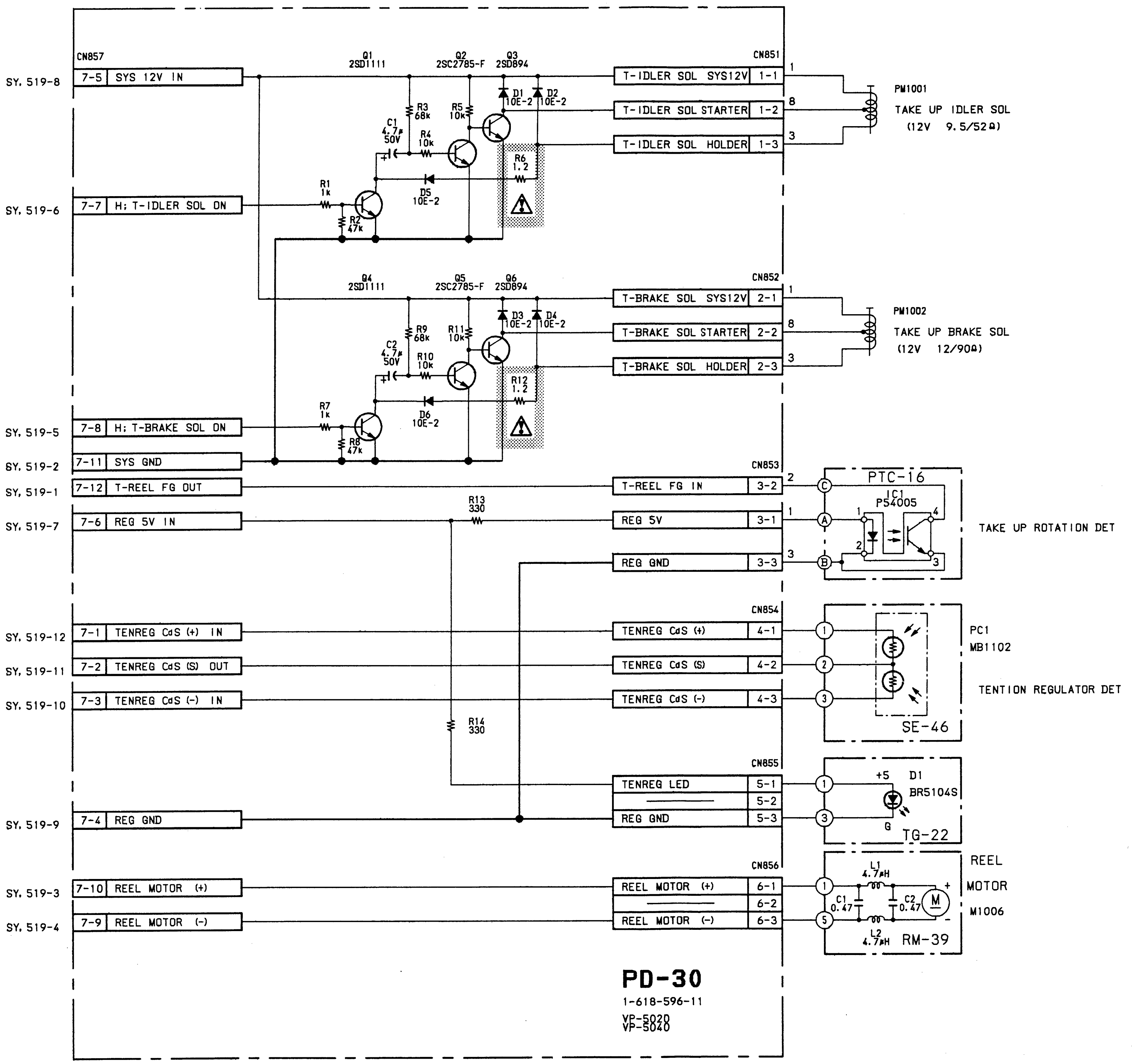

A
B
C
SONY JAPAN
IC1
SW-50
1-603-435-11

SW-50

– SOLDERING SIDE –

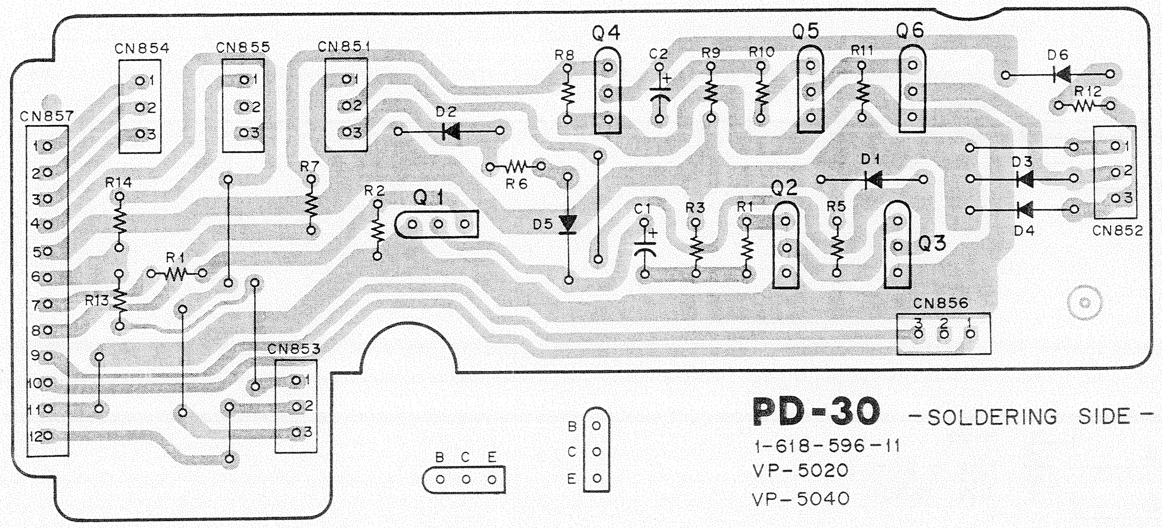
1-603-435-11
VP-5020
VP-5040

PD-30 ;	PLUNGER SOLENOID
RM-39 ;	REEL MOTOR
SE-46 ;	TENTION REGULATOR
PTC-16 ;	TAKE UP ROTATION DET.
TG-22 ;	LED FOR TENSION REG

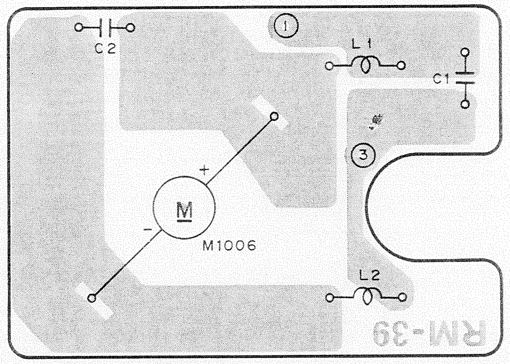

CN857
SY. 519-8 7-5 SYS 12V IN
SY. 519-6 7-7 H; T-IDLER SOL ON
SY. 519-5 7-8 H; T-BRAKE SOL ON
SY. 519-2 7-11 SYS GND
SY. 519-1 7-12 T-REEL FG OUT
SY. 519-7 7-6 REG 5V IN
SY. 519-12 7-1 TENREG CdS (+) IN
SY. 519-11 7-2 TENREG CdS (S) OUT
SY. 519-10 7-3 TENREG CdS (-) IN
SY. 519-9 7-4 REG GND
SY. 519-3 7-10 REEL MOTOR (+)
SY. 519-4 7-9 REEL MOTOR (-)
Q1 2SD1111
Q2 2SC2785-F
Q3 2SD894
Q4 2SD1111
Q5 2SC2785-F
Q6 2SD894
R1 1k
R2 47k
R3 68k
R4 10k
R5 10k
R6 1.2
C1 4.7μ 50V
D1 10E-2
D2 10E-2
D5 10E-2
R7 1k
R8 47k
R9 68k
R10 10k
R11 10k
R12 1.2
C2 4.7μ 50V
D3 10E-2
D4 10E-2
D6 10E-2
R13 330
R14 330
CN851
T-IDLER SOL SYS12V 1-1
T-IDLER SOL STARTER 1-2
T-IDLER SOL HOLDER 1-3
PM1001
TAKE UP IDLER SOL
(12V 9.5/52Ω)
CN852
T-BRAKE SOL SYS12V 2-1
T-BRAKE SOL STARTER 2-2
T-BRAKE SOL HOLDER 2-3
PM1002
TAKE UP BRAKE SOL
(12V 12/90Ω)
CN853
T-REEL FG IN 3-2
REG 5V 3-1
REG GND 3-3
PTC-16
IC1 PS4005
TAKE UP ROTATION DET
CN854
TENREG CdS (+) 4-1
TENREG CdS (S) 4-2
TENREG CdS (-) 4-3
PC1 MB1102
TENTION REGULATOR DET
SE-46
CN855
TENREG LED 5-1
5-2
REG GND 5-3
+5 D1 BR5104S
G
TG-22
CN856
REEL MOTOR (+) 6-1
6-2
REEL MOTOR (-) 6-3
L1 4.7μH
L2 4.7μH
C1 0.47
C2 0.47
M
REEL MOTOR M1006
RM-39
PD-30
1-618-596-11
VP-5020
VP-5040

NOTE:

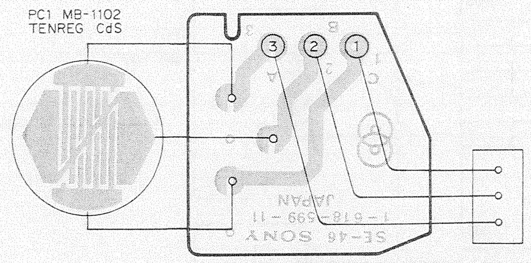
The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.


CN854
CN855
CN851
Q4
C2
R8
R9
R10
Q5
R11
Q6
D6
R12
CN857
D2
R6
R7
R14
R2
Q1
D1
D3
D5
C1
R3
R1
Q2
R5
Q3
D4
CN852
R1
R13
CN856
CN853
B C E
B
C
E

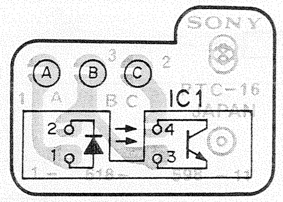
PD-30 -SOLDERING SIDE-
1-618-596-11
VP-5020
VP-5040


C2
①
L1
C1
③
M
M1006
L2
RM-39

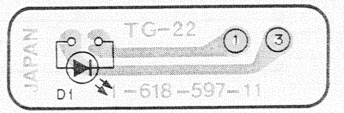
RM-39 -SOLDERING SIDE-
1-618-873-11
VP-5020
VP-5040


PC1 MB-1102
TENREG CdS
③ ② ①
SE-46 SONY
1-618-599-11
JAPAN

SE-46
-SOLDERING SIDE-
1-618-599-11
VP-5020
VP-5040

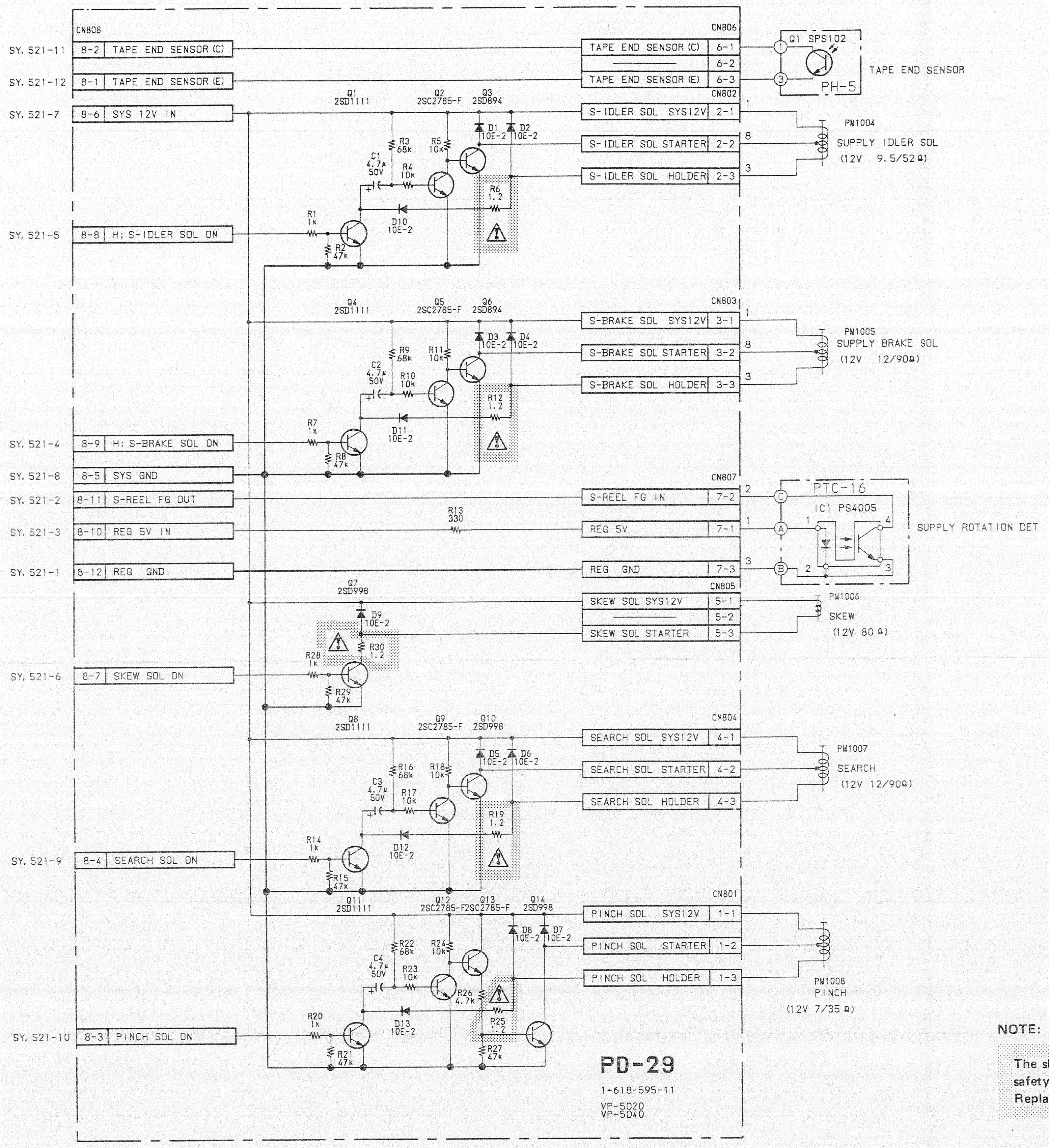

SONY
Ⓐ Ⓑ Ⓒ
IC1
PTC-16
JAPAN
1-618-598-11

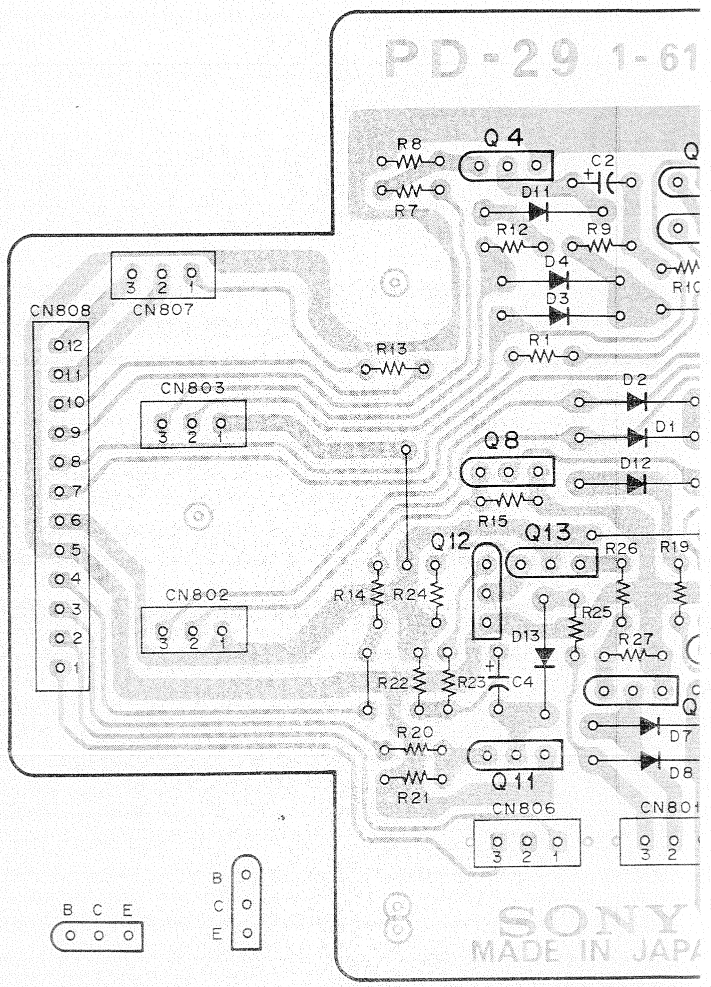
PTC-16
-SOLDERING SIDE-
1-618-598-11
VP-5020
VP-5040


TG-22
JAPAN
D1
1-618-597-11
① ③

TG-22
-SOLDERING SIDE-
1-618-597-11
VP-5020
VP-5040

PD-29 ; PLUNGER SOLENOID
PH-5 ; TAPE SENSOR
PTC-16 ; SUPPLY ROTATION DET.

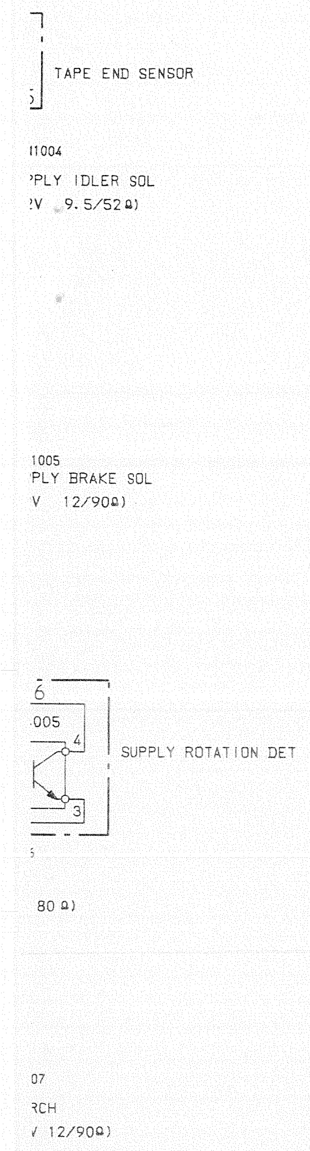

CN808
SY, 521-11 8-2 TAPE END SENSOR (C)
SY, 521-12 8-1 TAPE END SENSOR (E)
SY, 521-7 8-6 SYS 12V IN
SY, 521-5 8-8 H: S-IDLER SOL ON
SY, 521-4 8-9 H: S-BRAKE SOL ON
SY, 521-8 8-5 SYS GND
SY, 521-2 8-11 S-REEL FG OUT
SY, 521-3 8-10 REG 5V IN
SY, 521-1 8-12 REG GND
SY, 521-6 8-7 SKEW SOL ON
SY, 521-9 8-4 SEARCH SOL ON
SY, 521-10 8-3 PINCH SOL ON
CN806
TAPE END SENSOR (C) 6-1
6-2
TAPE END SENSOR (E) 6-3
Q1 SPS102
PH-5
TAPE END SENSOR
CN802
S-IDLER SOL SYS12V 2-1
S-IDLER SOL STARTER 2-2
S-IDLER SOL HOLDER 2-3
PM1004
SUPPLY IDLER SOL
(12V 9.5/52Ω)
CN803
S-BRAKE SOL SYS12V 3-1
S-BRAKE SOL STARTER 3-2
S-BRAKE SOL HOLDER 3-3
PM1005
SUPPLY BRAKE SOL
(12V 12/90Ω)
CN807
S-REEL FG IN 7-2
REG 5V 7-1
REG GND 7-3
PTC-16
IC1 PS4005
SUPPLY ROTATION DET
CN805
SKEW SOL SYS12V 5-1
5-2
SKEW SOL STARTER 5-3
PM1006
SKEW
(12V 80Ω)
CN804
SEARCH SOL SYS12V 4-1
SEARCH SOL STARTER 4-2
SEARCH SOL HOLDER 4-3
PM1007
SEARCH
(12V 12/90Ω)
CN801
PINCH SOL SYS12V 1-1
PINCH SOL STARTER 1-2
PINCH SOL HOLDER 1-3
PM1008
PINCH
(12V 7/35Ω)
Q1 2SD1111
Q2 2SC2785-F
Q3 2SD894
Q4 2SD1111
Q5 2SC2785-F
Q6 2SD894
Q7 2SD998
Q8 2SD1111
Q9 2SC2785-F
Q10 2SD998
Q11 2SD1111
Q12 2SC2785-F
Q13 2SC2785-F
Q14 2SD998
R13 330
PD-29
1-618-595-11
VP-5020
VP-5040

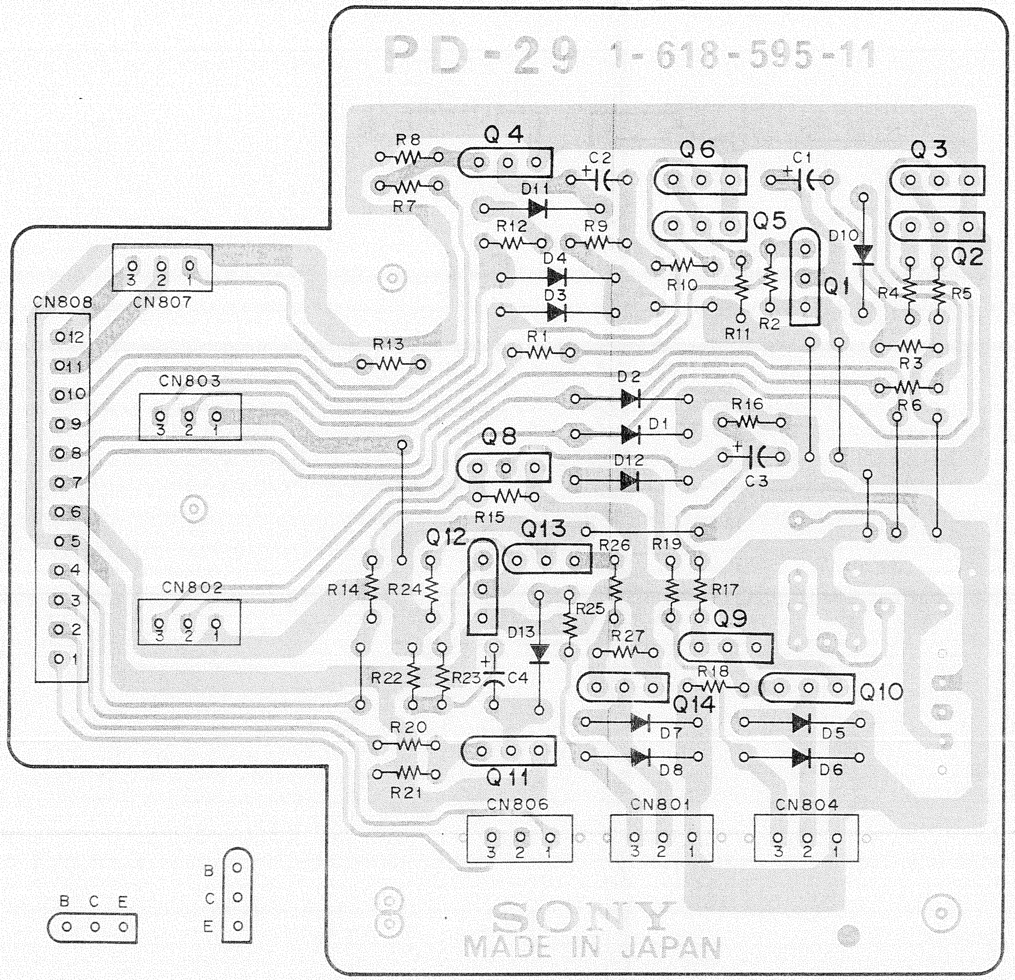

PD-29 1-61
CN808
CN807
CN803
CN802
CN806
CN801
Q4
Q8
Q11
Q12
Q13
B C E
SONY
MADE IN JAPA

PD-29
1-618-595-
VP-5020
VP-5040

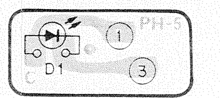
NOTE:

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

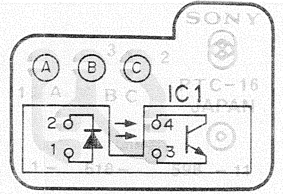

TAPE END SENSOR
I1004
PLY IDLER SOL
V 9.5/52Ω)
1005
PLY BRAKE SOL
V 12/90Ω)
6
005
4
3
SUPPLY ROTATION DET
80 Ω)
07
RCH
V 12/90Ω)


PD-29 1-618-595-11
Q4
Q6
Q3
Q5
Q2
Q1
Q8
Q12
Q13
Q9
Q14
Q10
Q11
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
C1
C2
C3
C4
D1
D2
D3
D4
D5
D6
D7
D8
D10
D11
D12
D13
CN808
CN807
CN803
CN802
CN806
CN801
CN804
SONY
MADE IN JAPAN
B C E
B
C
E

PD-29 -SOLDERING SIDE-
1-618-595-11
VP-5020
VP-5040



PH-5
-SOLDERING SIDE-
1-603-737-11
VP-5020
VP-5040

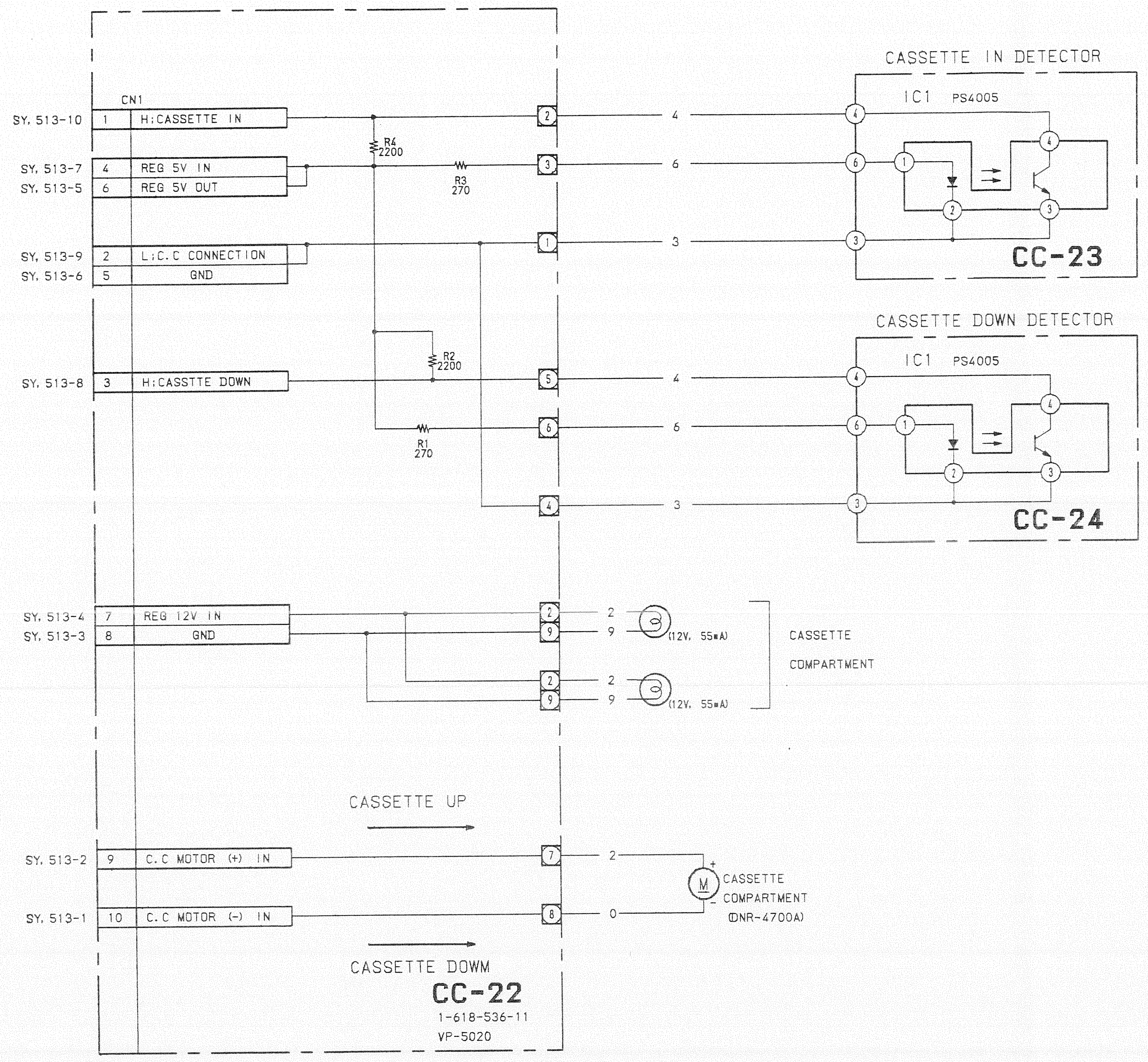

SONY
PTC-16
A
B
C
IC1
1
2
3
4

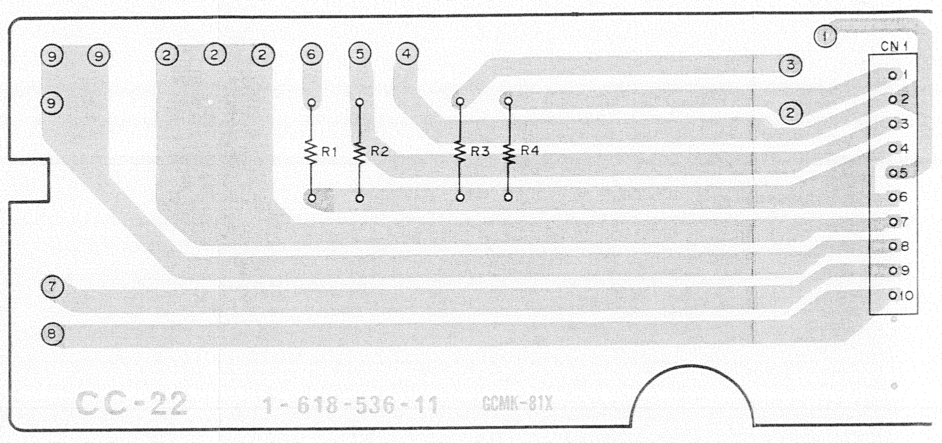
PTC-16
-SOLDERING SIDE-
1-618-598-11
VP-5020
VP-5040

NOTE:

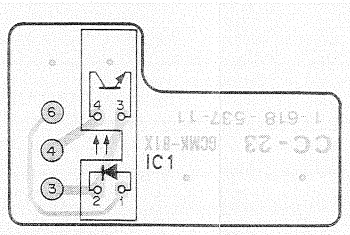
The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

CC-22 ;
CC-23 ; CASSETTE COMPARTMENT
CC-24 ;

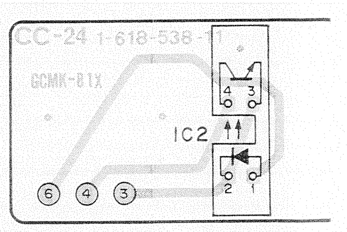

CN1
SY. 513-10
1 H:CASSETTE IN
SY. 513-7
4 REG 5V IN
SY. 513-5
6 REG 5V OUT
SY. 513-9
2 L:C.C CONNECTION
SY. 513-6
5 GND
SY. 513-8
3 H:CASSTTE DOWN
SY. 513-4
7 REG 12V IN
SY. 513-3
8 GND
SY. 513-2
9 C.C MOTOR (+) IN
SY. 513-1
10 C.C MOTOR (-) IN
R4 2200
R3 270
R2 2200
R1 270
CASSETTE IN DETECTOR
IC1 PS4005
CC-23
CASSETTE DOWN DETECTOR
IC1 PS4005
CC-24
(12V, 55mA)
(12V, 55mA)
CASSETTE COMPARTMENT
CASSETTE UP
M
CASSETTE COMPARTMENT (DNR-4700A)
CASSETTE DOWM
CC-22
1-618-536-11
VP-5020


CN1
R1
R2
R3
R4
CC-22 1-618-536-11 GCMK-81X

CC-22 -SOLDERING SIDE-
1-618-536-11
VP-5020
VP-5040

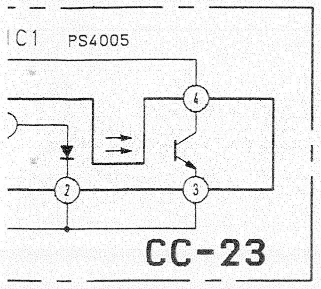


CC-23 -SOLDERING SIDE-
1-618-537-11
VP-5020
VP-5040

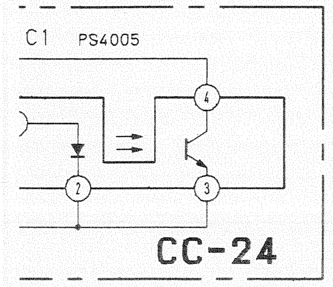

CC-24 1-618-538-11
GCMK-81X
IC2

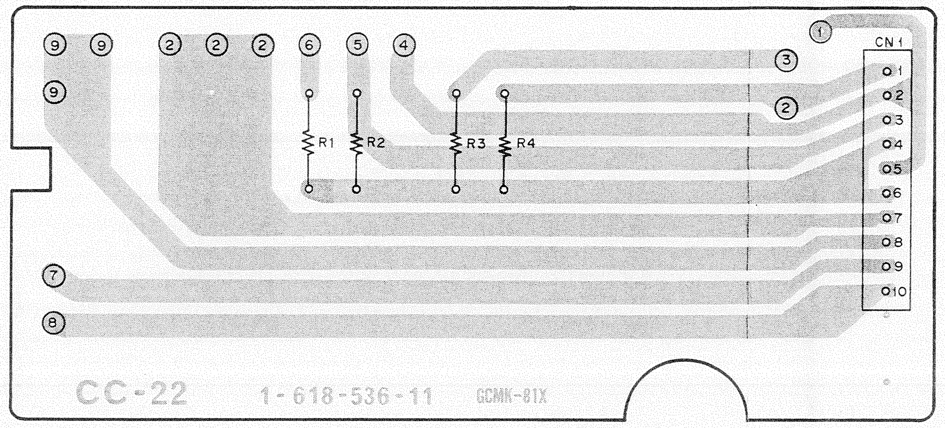
CC-24 -SOLDERING SIDE
1-618-538-11
VP-5020
VP-5040

SSETTE IN DETECTOR

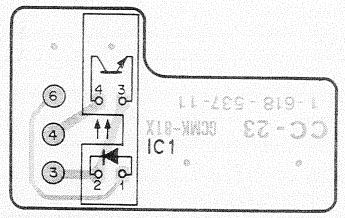

IC1 PS4005
4
2
3
CC-23

SETTE DOWN DETECTOR

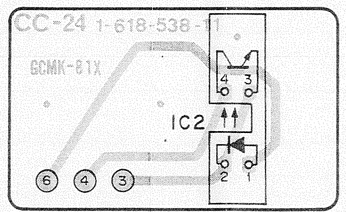

C1 PS4005
4
2
3
CC-24


9
9
2
2
2
6
5
4
9
1
3
2
CN1
1
2
3
4
5
6
7
8
9
10
R1
R2
R3
R4
7
8
CC-22 1-618-536-11 GCMK-81X

CC-22 -SOLDERING SIDE-
1-618-536-11
VP-5020
VP-5040

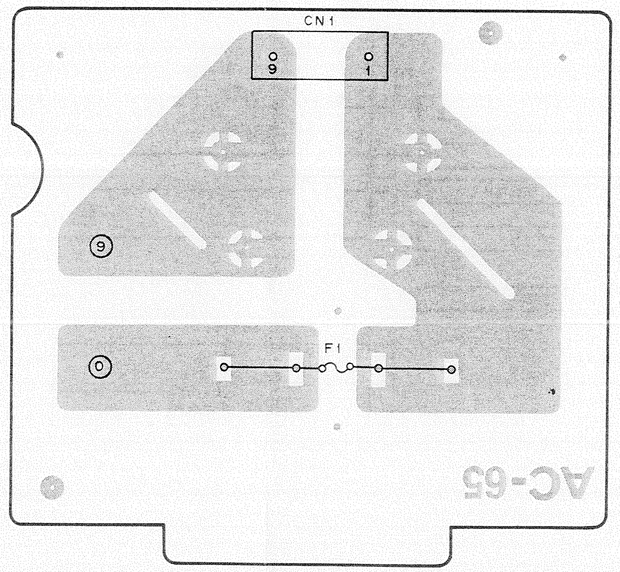

6
4
3
4 3
2 1
IC1
CC-23 1-618-537-11 GCMK-81X

CC-23 -SOLDERING SIDE-
1-618-537-11
VP-5020
VP-5040


CC-24 1-618-538-11
GCMK-81X
4 3
IC2
2 1
6
4
3

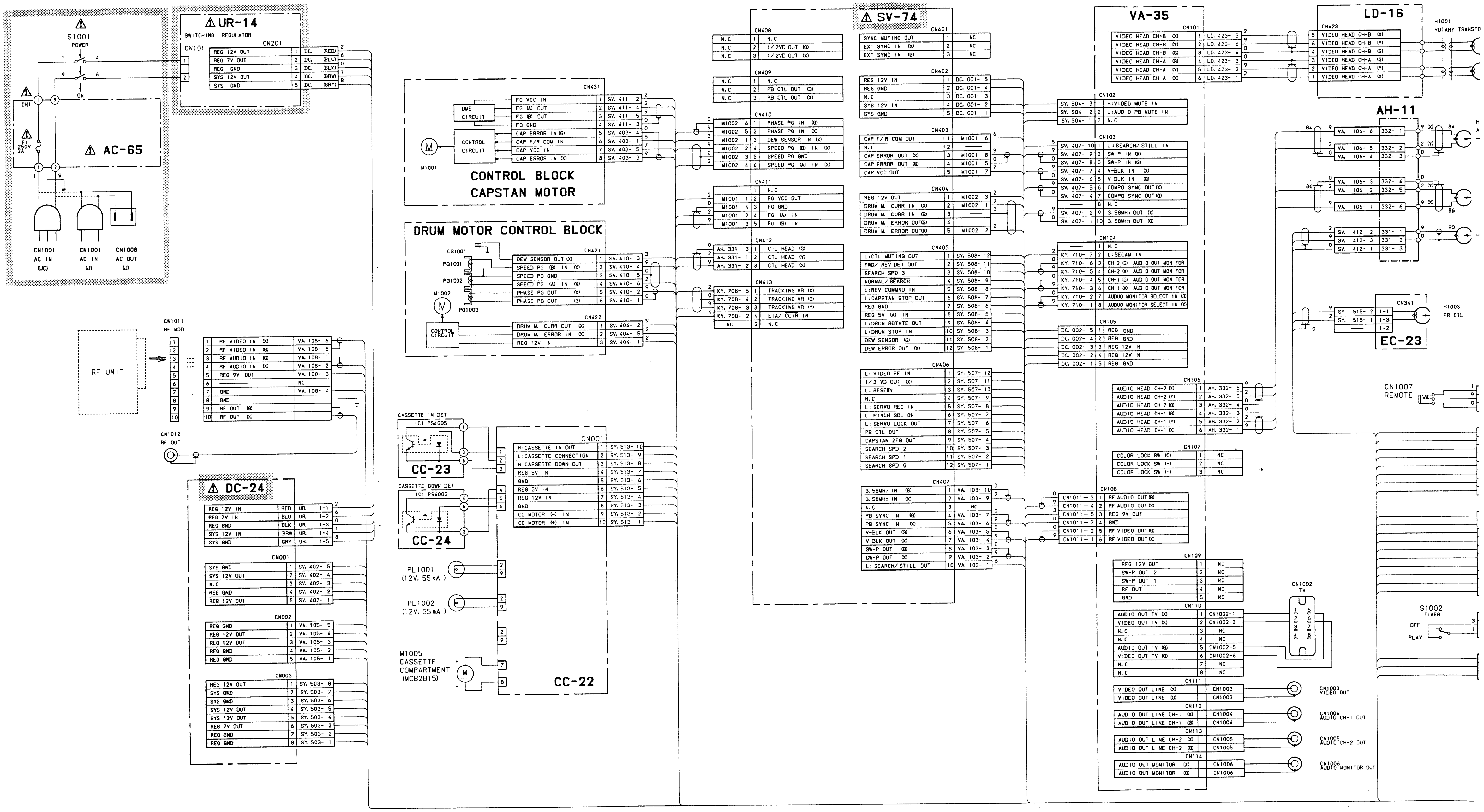
CC-24 -SOLDERING SIDE-
1-618-538-11
VP-5020
VP-5040

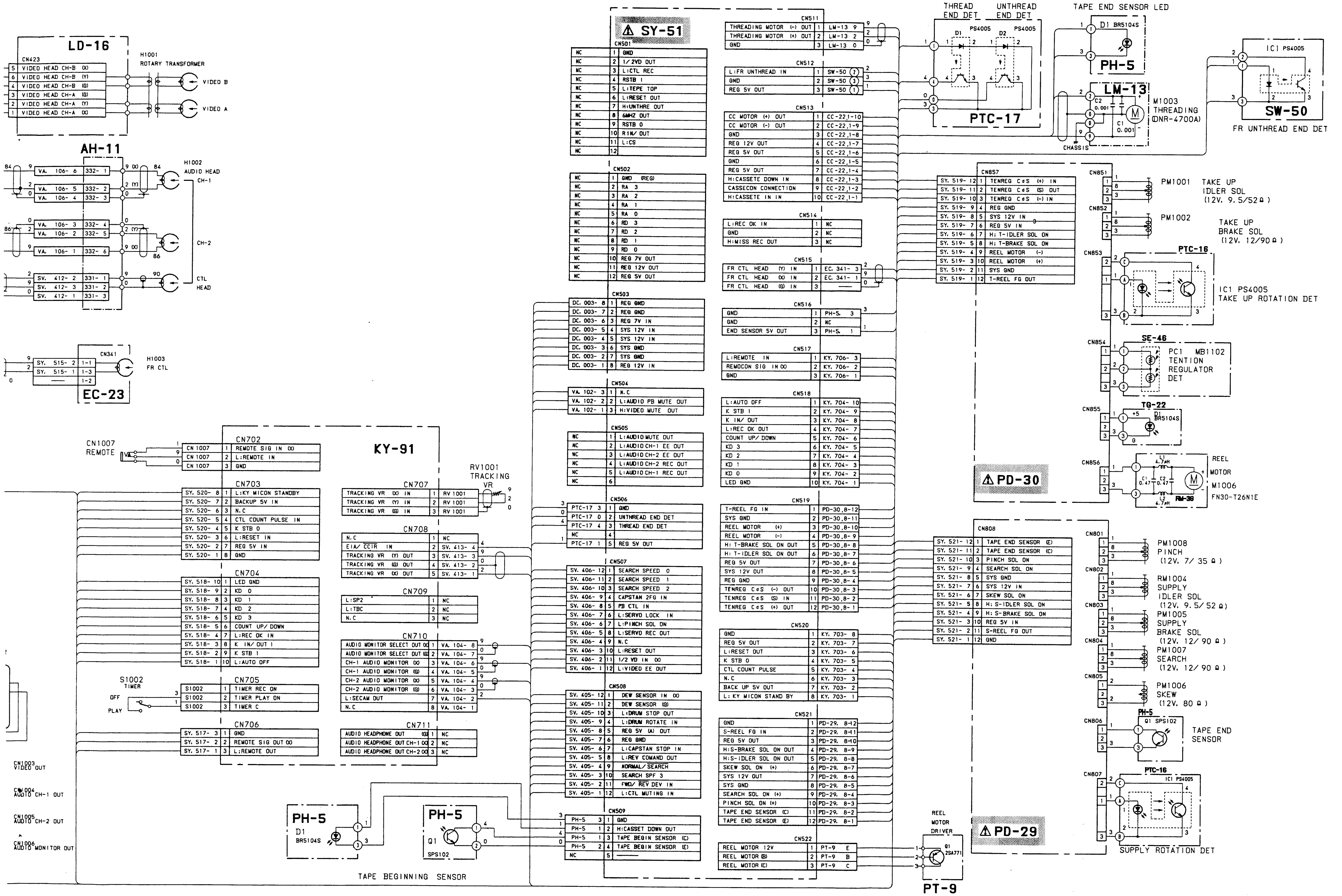
AC-65 ; AC INPUT


CN1
9
1
9
0
F1
AC-65

AC-65 -SOLDERING SIDE-
1-618-591-11
VP-5020

FRAME


UR-14
SWITCHING REGULATOR
CN101
CN201
REG 12V OUT
REG 7V OUT
REG GND
SYS 12V OUT
SYS GND
S1001
POWER
ON
CN1
F1
AC-65
CN1001
AC IN
CN1008
AC OUT
CN1011
RF MOD
RF UNIT
CN1012
RF OUT
DC-24
CN001
CN002
CN003
CONTROL BLOCK
CAPSTAN MOTOR
CN431
DME CIRCUIT
CONTROL CIRCUIT
M1001
DRUM MOTOR CONTROL BLOCK
CN421
CN422
CS1001
PG1001
PG1002
M1002
PG1003
CASSETTE IN DET
IC1 PS4005
CC-23
CASSETTE DOWN DET
CC-24
CN001
PL1001
(12V, 55mA)
PL1002
(12V, 55mA)
M1005
CASSETTE COMPARTMENT
(MCB2B15)
CC-22
SV-74
CN408
CN409
CN410
CN411
CN412
CN413
CN401
CN402
CN403
CN404
CN405
CN406
CN407
VA-35
CN101
CN102
CN103
CN104
CN105
CN106
CN107
CN108
CN109
CN110
CN111
CN112
CN113
CN114
LD-16
CN423
H1001
ROTARY TRANSFO
AH-11
EC-23
CN341
H1003
FR CTL
CN1007
REMOTE
CN1002
TV
S1002
TIMER
OFF
PLAY
CN1003
VIDEO OUT
CN1004
AUDIO CH-1 OUT
CN1005
AUDIO CH-2 OUT
CN1006
AUDIO MONITOR OUT


LD-16
H1001 ROTARY TRANSFORMER
VIDEO B
VIDEO A
AH-11
H1002 AUDIO HEAD
CH-1
CH-2
CTL HEAD
H1003 FR CTL
EC-23
SY-51
CN501
CN502
CN503
CN504
CN505
CN506
CN507
CN508
CN509
CN511
CN512
CN513
CN514
CN515
CN516
CN517
CN518
CN519
CN520
CN521
CN522
KY-91
CN702
CN703
CN704
CN705
CN706
CN707
CN708
CN709
CN710
CN711
CN1007 REMOTE
RV1001 TRACKING VR
S1002 TIMER
OFF
PLAY
PH-5
D1 BR5104S
Q1 SPS102
TAPE BEGINNING SENSOR
CN1003 VIDEO OUT
CN1004 AUDIO CH-1 OUT
CN1005 AUDIO CH-2 OUT
CN1006 AUDIO MONITOR OUT
THREAD END DET
UNTHREAD END DET
PTC-17
TAPE END SENSOR LED
LM-13
M1003 THREADING (DNR-4700A)
CHASSIS
IC1 PS4005
SW-50
FR UNTHREAD END DET
PD-30
CN857
CN851
PM1001 TAKE UP IDLER SOL (12V, 9.5/52 Ω)
CN852
PM1002 TAKE UP BRAKE SOL (12V, 12/90 Ω)
CN853
PTC-16
IC1 PS4005 TAKE UP ROTATION DET
CN854
SE-46
PC1 MB1102 TENTION REGULATOR DET
CN855
TG-22
CN856
REEL MOTOR M1006 FN30-T26N1E
RM-38
PD-29
CN808
CN801
PM1008 PINCH (12V, 7/35 Ω)
CN802
RM1004 SUPPLY IDLER SOL (12V, 9.5/52 Ω)
CN803
PM1005 SUPPLY BRAKE SOL (12V, 12/90 Ω)
CN804
PM1007 SEARCH (12V, 12/90 Ω)
CN805
PM1006 SKEW (12V, 80 Ω)
CN806
TAPE END SENSOR
CN807
SUPPLY ROTATION DET
REEL MOTOR DRIVER
Q1 2SA771
PT-9

NOTE:

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

SECTION 15
SPARE PARTS AND FIXTURE

15-1. PARTS INFORMATION

(1)

> The shaded and ⚠ -marked components are critical to safety.
> Replace only with same components as specified.

(2) Replacement Parts supplied from the Sony Parts Center will sometimes have a different shape from the original parts. This is due to "improved parts and/or engineering changes" or "standardization of genuine parts".
This manual's exploded views and electrical spare parts list indicate the part numbers of "the standardized genuine parts at the present". Regarding engineering part changes by the engineering department, refer to Sony service bulletins and service manual supplements.

(3) The parts marked with "s" in the SP column of the exploded views and electrical spare parts lists are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

(4) Items with no part number and/or no description are not stocked because they are seldom required for routine service.

(5) (T) after a spring description is shown on the exploded views in order to indicate the number of spring turns required for the use. (Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

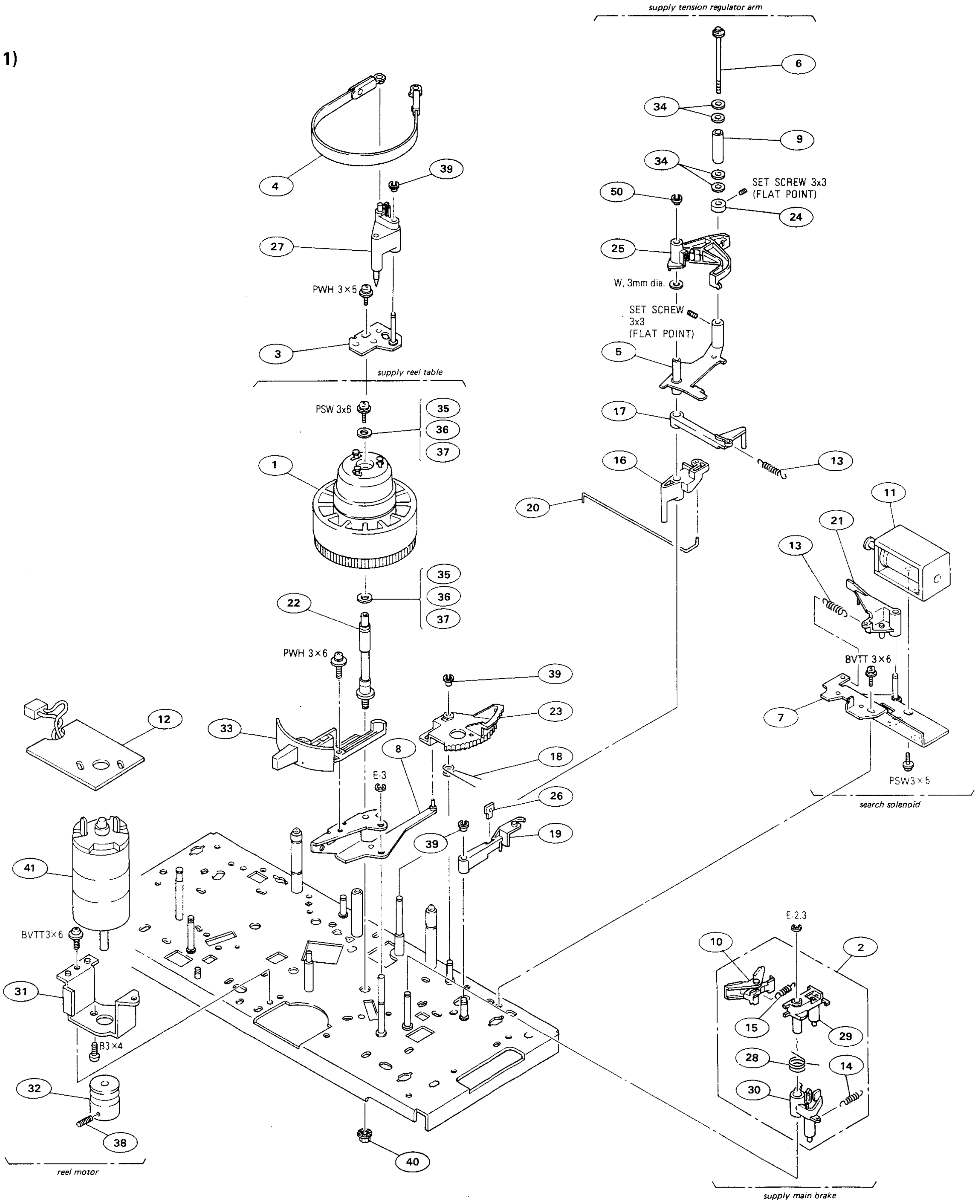
15-2. EXPLODED VIEW

. Exploded views are composed of the following blocks.

(1) Reel Chassis (1)
    supply reel table
    supply tension regulator arm
    search solenoid
    supply main brake
    reel motor
(2) Reel Chassis (2)
    take-up reel table
    FF/REW idler
    take-up main brake
    take-up tension regulator arm
    R brake
(3) Reel Chassis (3)
    supply idler solenoid
    take-up idler solenoid
    FF/REW idler pulley
    supply brake solenoid
    take-up brake solenoid
(4) Threading Ring Block
    threading ring
    gear box
    T correction guide
    tape beginning sensor
    FR detector
(5) Threading Arm
    T drawer arm
    S drawer arm
    S drawer roller
    drawer lever
(6) Drum and Capstan Blocks
    head drum
    capstan motor
    audio/CTL head
(7) Erase Head Base and S Guard Blocks
    erase head base
    S guard

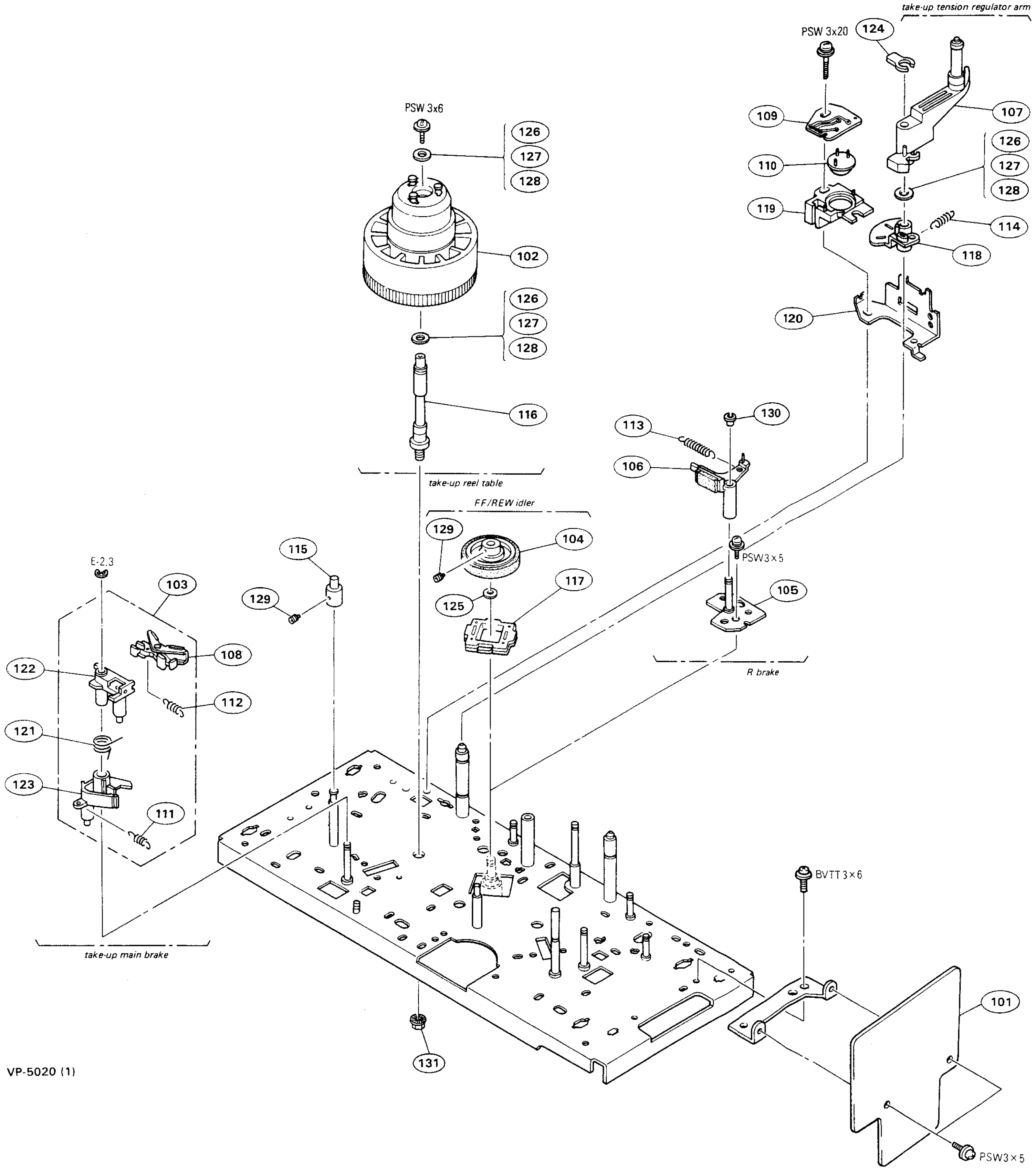
(8) Pinch Lever and Pinch Solenoid Blocks
    pinch lever
    pinch roller pre-set cam
    pinch solenoid
(9) Cassette-up Compartment Block
(10) Function Control
    function control panel (except ornamental panel)
(11) Front Panel Block
    ornamental front panel
    key top
(12) Chassis Block (1)
    meter panel
    power switch block
    cassette holder
(13) Chassis block (2)
    printed circuit boards
(14) Rear Panel
    switching regulator
    RF case
    printed circuit boards
(15) Ornamental Panel Block
    ornamental panels

1. REEL CHASSIS (1)


supply tension regulator arm
6
34
9
34
SET SCREW 3x3 (FLAT POINT)
50
24
25
W. 3mm dia.
SET SCREW 3x3 (FLAT POINT)
5
17
13
16
20
4
39
27
PWH 3×5
3
supply reel table
PSW 3x6
35
36
37
1
35
36
37
22
PWH 3×6
39
23
18
26
19
39
8
E-3
33
12
41
BVTT3×6
31
B3×4
32
38
reel motor
40
11
21
13
BVTT 3×6
7
PSW3×5
search solenoid
E-2.3
10
2
15
29
28
14
30
supply main brake

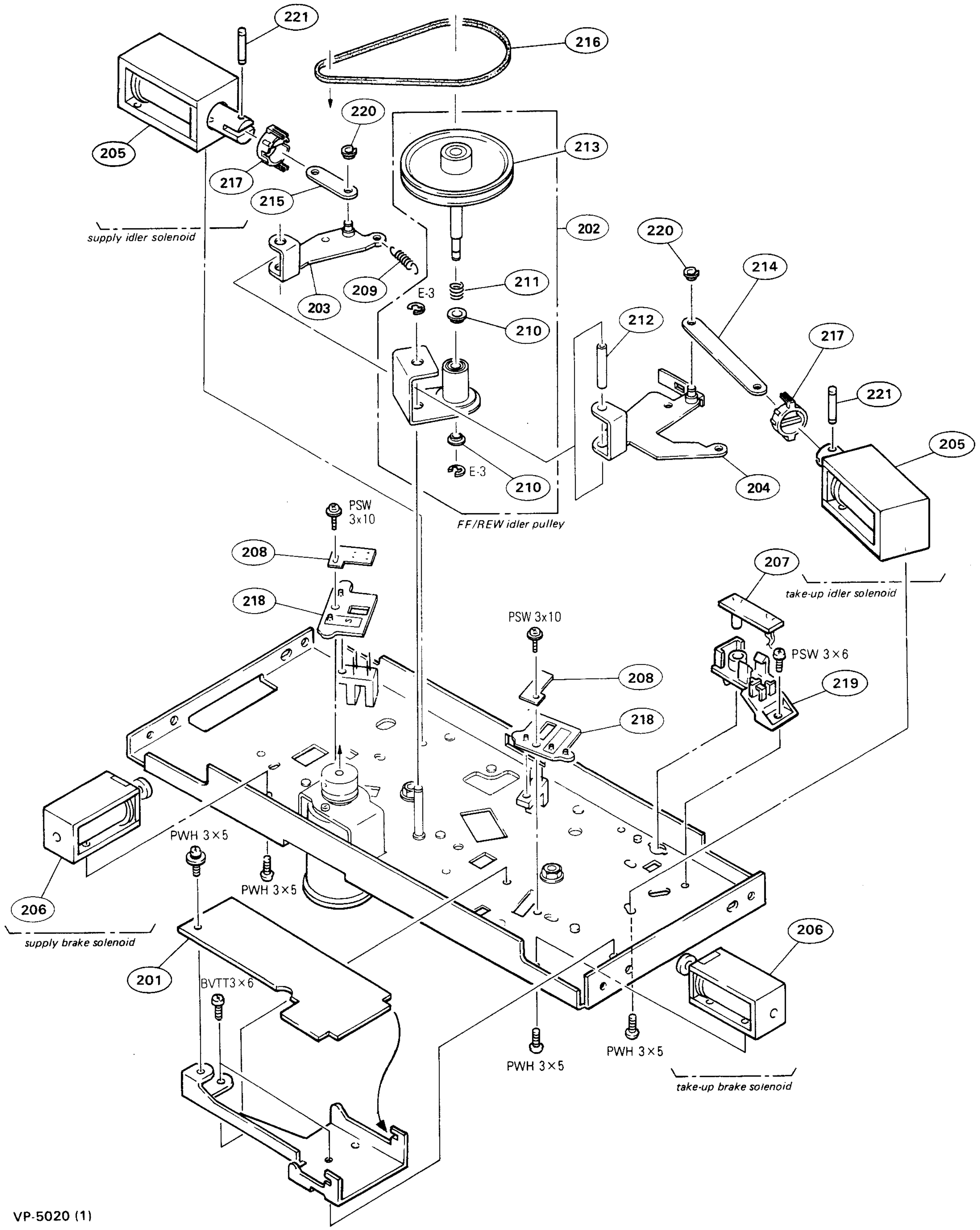
No.	Part No.	SP	Description
1	A-6739-017-A	s	TABLE ASS'Y, REEL
2	A-6741-038-B	s	BRAKE ASS'Y, MAIN
3	X-3668-706-0	o	BASE ASS'Y, S TENSION REGULATOR
4	X-3668-707-0	s	BAND ASS'Y, S TENSION REGULATOR
5	X-3668-708-0	s	ARM (A) ASS'Y, S TENSION REGULATOR
6	X-3668-709-0	s	SHAFT (1) ASS'Y, ROLLER
7	X-3668-717-0	o	BASE ASS'Y, SEARCH
8	X-3668-725-0	o	ARM (C) ASS'Y, SKEW
9	X-3668-727-0	o	GUIDE ASS'Y, TAPE
10	X-3668-749-0	s	HOLDER ASS'Y, LINING
11	1-454-417-11	s	SOLENOID, PLUNGER
12	1-618-873-11	o	PRINTED CIRCUIT BOARD, RM-39
13	3-534-238-XX	s	SPRING, TENSION (23T)
14	3-535-369-XX	s	SPRING, TENSION (12T)
15	3-548-124-00	s	SPRING, TENSION
16	3-668-787-02	s	ARM, S DETECTION
17	3-668-794-00	o	ARM (A), SKEW
18	3-668-795-00	s	SPRING
19	3-668-797-00	o	ARM, SKEW LOCK
20	3-668-804-00	s	LINK, DETECTION, TENSION
21	3-668-808-00	s	ARM, FWD, SEARCH
22	3-668-827-00	o	SHAFT (S), REEL
23	3-668-835-00	s	ARM (B), SKEW
24	3-668-874-00	s	FLANGE (1), LOWER
25	3-668-936-00	s	ARM (B), S TENSION REGULATOR
26	3-668-937-00	s	CLAM, SKEW LOCK
27	3-668-939-00	o	ARM, BAND LOCK
28	3-668-966-00	s	SPRING
29	3-668-970-00	o	ARM, BRAKE
30	3-668-971-00	o	ARM, BRAKE RELEASE
31	3-672-743-01	o	BRACKET, MOTOR
32	3-672-744-01	s	PULLEY (R), MOTOR
33	3-672-787-01	s	LEVER, SKEW
34	3-701-438-01	s	WASHER, POLY 2.5MM DIA., 0.13T
35	3-701-444-01	s	WASHER, POLY 6MM DIA., 0.13T
36	3-701-444-11	s	WASHER, POLY 6MM DIA., 0.25T
37	3-701-444-21	s	WASHER, POLY 6MM DIA., 0.5T
38	3-701-506-01	s	SET SCREW, DOUBLE POINT 3x4
39	3-703-074-00	s	CAP 3, SHAFT
40	4-304-749-00	o	NUT, FLANGE
41	8-835-178-01	s	MOTOR, DC FN30-T26N1E

2. REEL CHASSIS (2)


take-up tension regulator arm
PSW 3x20
124
107
109
110
119
126
127
128
114
118
120
PSW 3x6
126
127
128
102
126
127
128
116
take-up reel table
FF/REW idler
113
130
106
129
104
115
129
125
117
PSW3×5
105
R brake
E-2.3
103
108
122
112
121
123
111
take-up main brake
BVTT3×6
101
131
PSW3×5
VP-5020 (1)

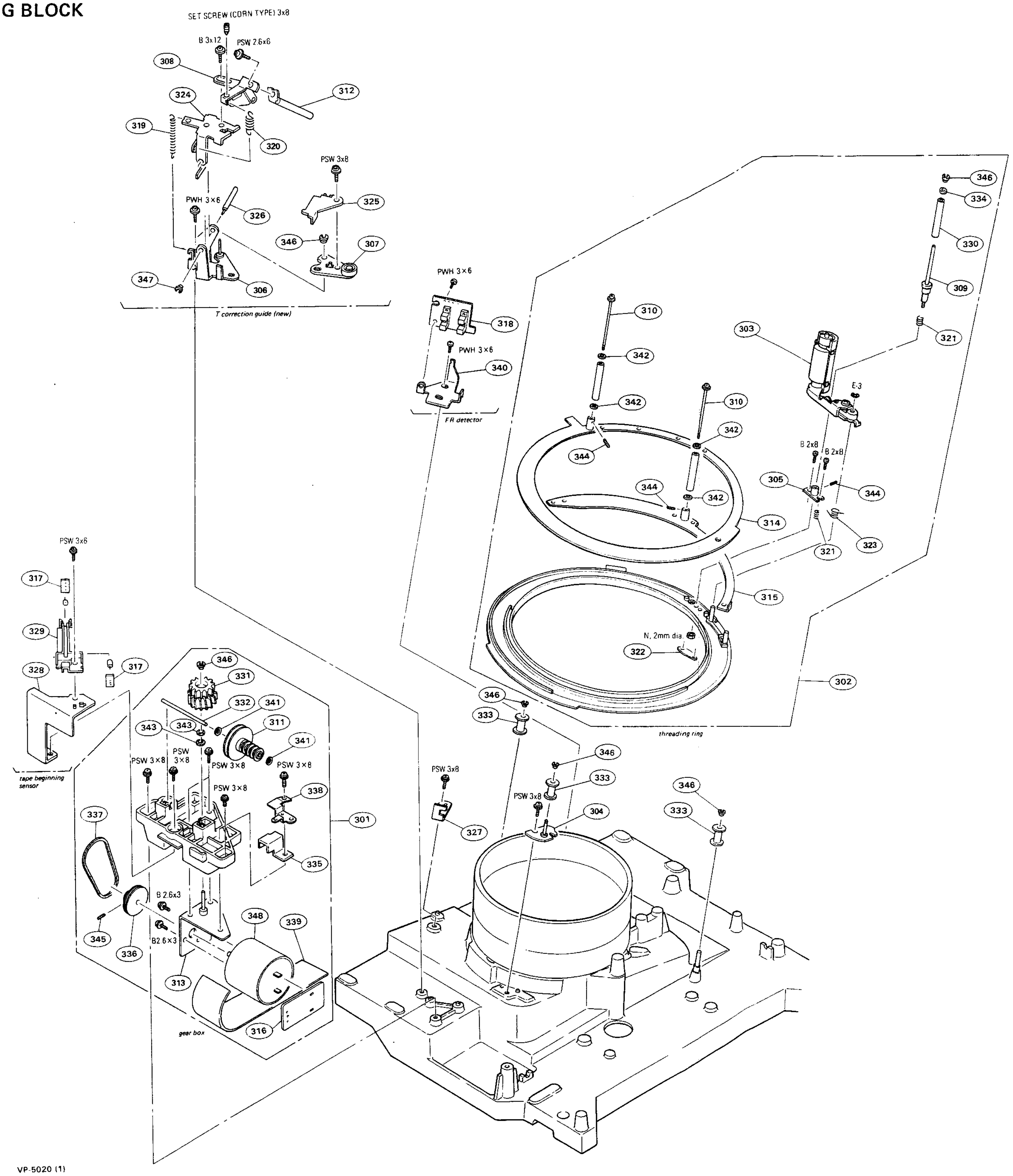
No.	Part No.	SP	Description
⚠101	A-6725-536-A	o	MOUNTED CIRCUIT BOARD, PD-29
102	A-6739-017-A	s	TABLE ASS'Y REEL
103	A-6741-038-B	s	BRAKE ASS'Y MAIN
104	X-3646-026-0	s	IDLER ASS'Y FF
105	X-3668-705-0	o	BASE ASS'Y R BRAKE
106	X-3668-737-0	s	BRAKE ASS'Y R
107	X-3668-738-0	s	ARM ASS'Y T TENSION REGULATOR
108	X-3668-749-0	s	HOLDER ASS'Y LINING
109	1-618-599-11	o	PRINTED CIRCUIT BOARD, SE-46
110	1-806-232-21	s	DETECTOR MB-1102/S.N
111	3-535-369-XX	s	SPRING, TENSION (12T)
112	3-548-124-00	s	SPRING, TENSION
113	3-549-861-00	s	SPRING, TENSION
114	3-642-427-00	s	SPRING, TENSION
115	3-668-031-00	o	RETAINER (UPPER), CASSETTE
116	3-668-766-00	o	SHAFT (T), REEL
117	3-668-780-00	o	CUSHION, IDELER
118	3-668-788-00	s	ARM, T DETECTION
119	3-668-789-00	o	HOLDER, BRIDGE, PHOTO
120	3-668-798-00	o	STOPPER, T TENSION LEGULATOR
121	3-668-966-00	s	SPRING
122	3-668-970-00	o	ARM, BRAKE
123	3-668-971-02	o	ARM, BRAKE RELEASE
124	3-672-708-00	o	STOPPER, T TENSION REGULATOR
125	3-701-441-21	s	WASHER, POLY 4MM DIA., 0.5T
126	3-701-444-01	s	WASHER, POLY 6MM DIA., 0.13T
127	3-701-444-11	s	WASHER, POLY 6MM DIA., 0.25T
128	3-701-444-21	s	WASHER, POLY 6MM DIA., 0.5T
129	3-701-506-01	s	SET SCREW, DOUBLE POINT 3x4
130	3-703-074-00	s	CAP 3, SHAFT
131	4-304-749-00	o	NUT, FLANGE

3. REEL CHASSIS (3)


221
216
220
213
205
217
215
202
supply idler solenoid
209
E-3
211
203
210
220
214
212
217
221
205
210
E-3
204
FF/REW idler pulley
PSW 3x10
208
218
207
take-up idler solenoid
PSW 3x10
208
PSW 3×6
219
218
PWH 3×5
PWH 3×5
206
supply brake solenoid
201
BVTT3×6
206
PWH 3×5
PWH 3×5
take-up brake solenoid

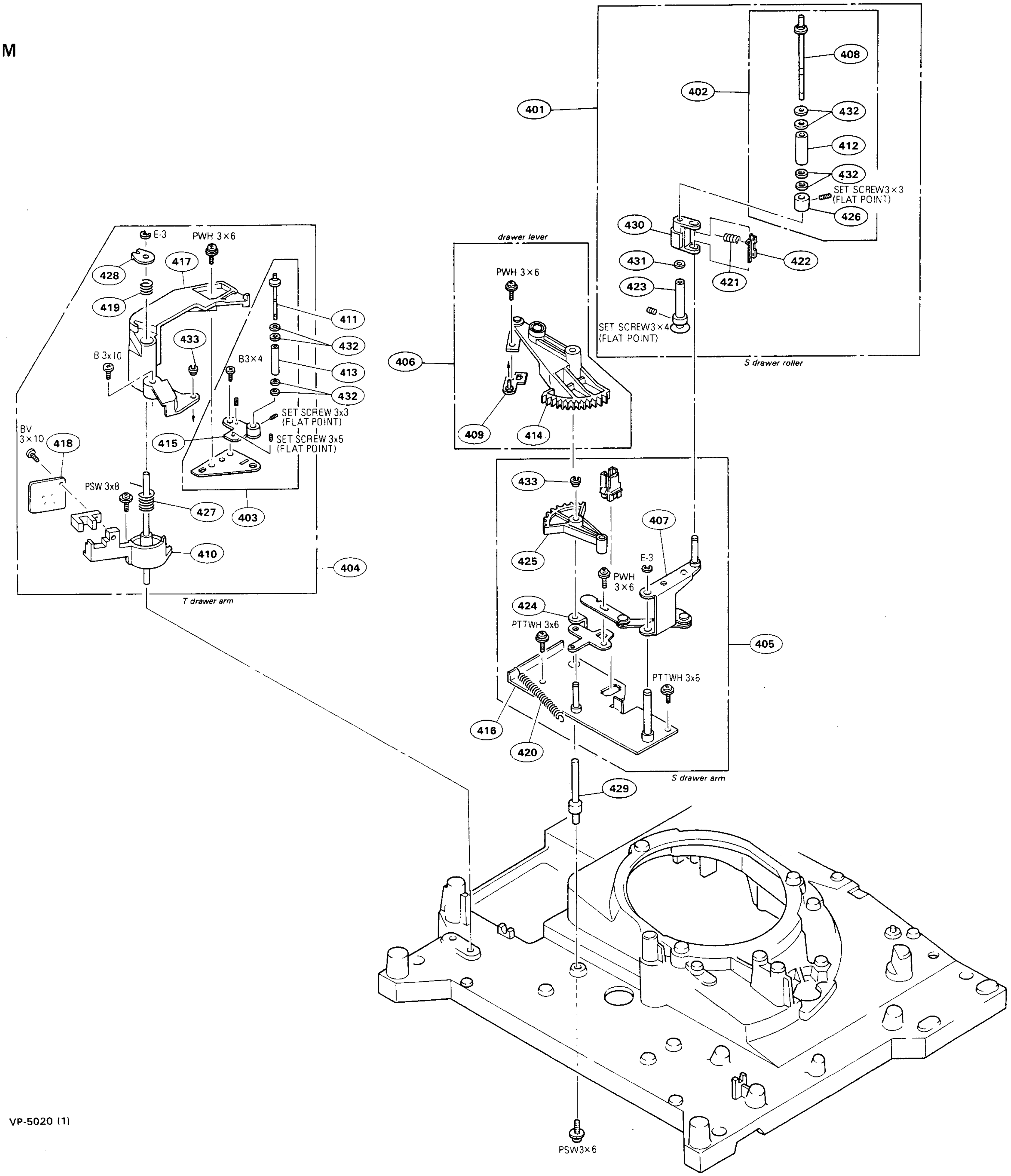
No.	Part No.	SP	Description
⚠201	A-6725-537-A	o	MOUNTED CIRCUIT BOARD, PD-30
202	A-6740-069-B	s	PULLEY BLOCK ASS'Y IDLER
203	X-3668-703-0	o	LEVER ASS'Y, S
204	X-3668-704-0	o	LEVER ASS'Y, T
205	1-454-415-11	s	SOLENOID, PLUNGER
206	1-454-417-11	s	SOLENOID, PLUNGER
207	1-618-597-11	o	PRINTED CIRCUIT BOARD, TG-22
208	1-618-598-11	o	PRINTED CIRCUIT BOARD, PTC-16
209	3-437-452-00	s	SPRING, TENSION
210	3-650-512-00	s	COLLAR, (A)
211	3-651-572-00	s	SPRING, COMPRESSION
212	3-668-048-11	o	SPACER (DIA. 4x20)
213	3-668-772-00	s	SHAFT, IDELER PULLEY
214	3-668-781-00	o	JOINT, T
215	3-668-782-00	o	JOINT, S
216	3-668-785-00	s	BELT (67x2)
217	3-668-826-00	s	RETAINER PIN, SOLENOID
218	3-668-828-00	o	BRACKET, PS
219	3-672-752-01	o	HOLDER, LED
220	3-703-074-00	s	CAP 3, SHAFT
221	3-703-360-04	o	PIN, PARALLEL

4. THREADING RING BLOCK


SET SCREW (CORN TYPE) 3x8
B 3x12
PSW 2.6x6
308
312
324
319
320
PSW 3x8
325
PWH 3x6
326
346
307
347
306
T correction guide (new)
PWH 3x6
318
PWH 3x6
340
FR detector
346
334
330
309
321
310
342
342
310
342
303
E-3
B 2x8
B 2x8
305
344
344
344
342
314
321
323
315
N, 2mm dia.
322
302
threading ring
PSW 3x6
317
329
328
317
tape beginning sensor
346
331
332
341
343
343
311
341
PSW 3x8
PSW 3x8
PSW 3x8
PSW 3x8
PSW 3x8
338
301
335
337
B 2.6x3
B2.6x3
345
336
348
339
313
316
gear box
PSW 3x8
327
346
333
346
333
PSW 3x8
304
346
333

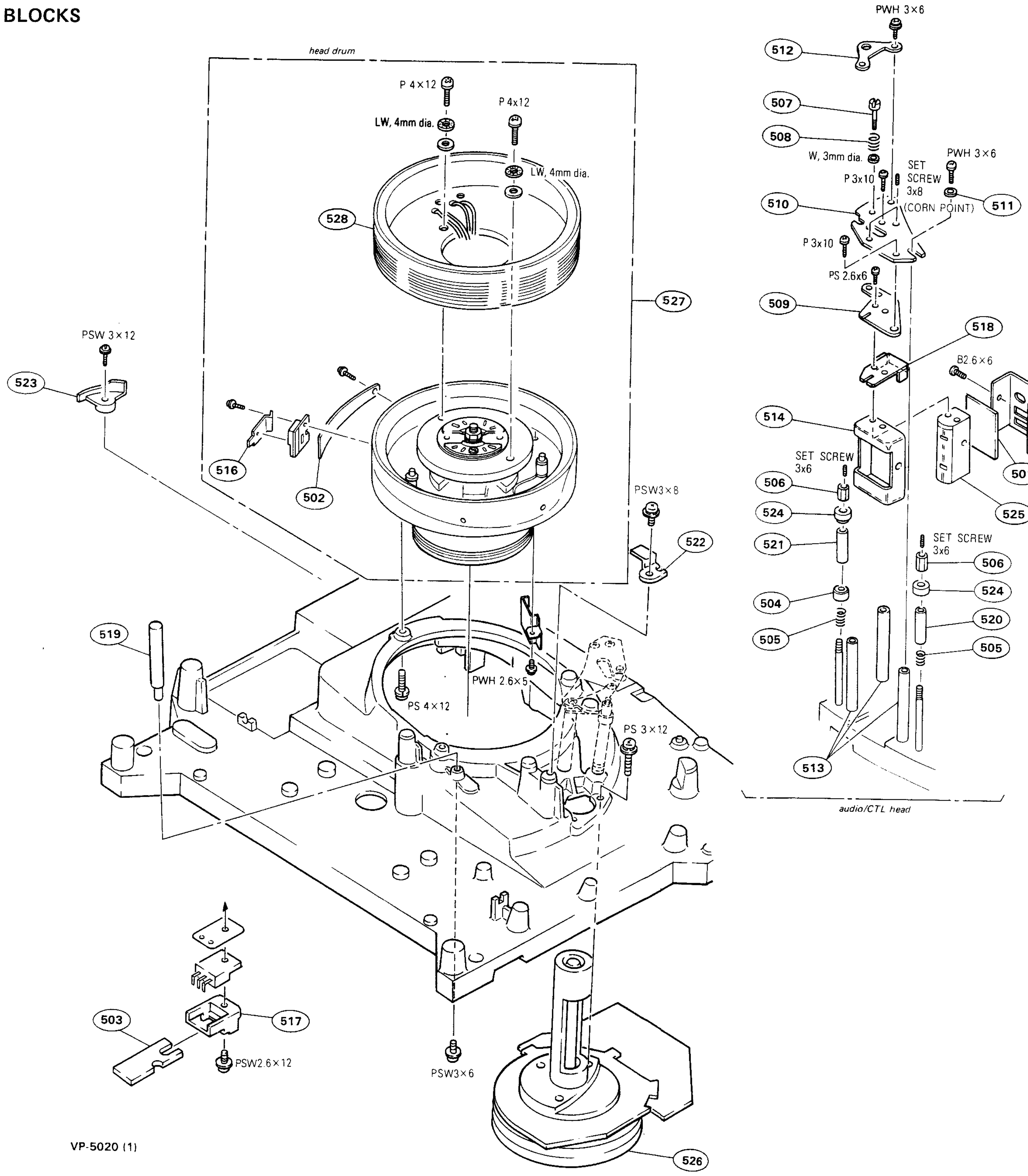
No.	Part No.	SP	Description
301	A-6750-203-A	s	BOX BLOCK ASS'Y, GEAR
302	A-6750-204-A	s	RING BLOCK ASS'Y, MAIN
303	A-6750-205-A	s	PINCH ROLLER BLOCK ASS'Y
304	X-3668-719-0	o	ROLLER ASS'Y, RING
305	X-3668-720-0	o	BASE ASS'Y, ROLLER, PRECEDING
306	X-3668-721-0	o	CHASSIS ASS'Y, GUIDE
307	X-3668-722-0	s	LOCKER ASS'Y, FR
308	X-3668-723-2	o	ARM ASS'Y, GUIDE, T CORRECTION
309	X-3668-724-3	s	SHAFT ASS'Y, ROLLER, PRECEDING
310	X-3668-733-0	s	SHAFT ASS'Y, SR GUIDE
311	X-3668-743-0	s	PULLEY ASS'Y, WORM
312	X-3668-756-3	s	SHAFT ASS'Y, T CORRECTION GUIDE
313	X-3672-704-1	o	BRACKET ASS'Y, MOTOR
314	X-3672-710-1	o	RING (UPPER) ASS'Y, SUB
315	X-3672-711-1	o	RING (LOWER) ASS'Y, SUB
316	1-618-600-11	s	PRINTED CIRCUIT BOARD, LM-13
317	1-603-737-00	o	PRINTED CIRCUIT BOARD, PH-5
318	1-618-872-11	o	PRINTED CIRCUIT BOARD, PTC-17
319	3-143-067-00	s	SPRING, TENSION
320	3-437-289-00	s	SPRING, TENSION
321	3-634-196-00	s	SPRING
322	3-668-743-00	o	NUT, PLATE, ROLLER, PRECEDING
323	3-668-745-00	s	SPRING
324	3-668-749-02	o	ARM (A), GUIDE, T CORRECTION
325	3-668-753-00	o	PLATE, ADJUSTMENT, FR LOCKER
326	3-668-754-00	o	SHAFT, GUIDE ARM, T CORRECTION
327	3-668-755-00	o	PLATE, STOPPER, SR
328	3-668-900-00	s	BLACKET, T SENSOR
329	3-668-901-00	s	HOLDER, T PHOTO
330	3-668-917-00	s	ROLLER, PRECEDING
331	3-668-947-00	s	PINION, L
332	3-668-948-00	o	SHAFT, WORM
333	3-668-963-00	s	ROLLER, RING
334	3-669-926-01	s	WASHER (3), THRUST
335	3-669-960-00	o	RETAINER, SHAFT
336	3-672-736-01	s	PULLEY, LM
337	3-672-737-01	s	BELT, SQUARE
338	3-672-738-01	o	PLATE, GROUND, SLED
339	3-672-739-01	o	BELT, LM SHIELD
340	3-672-790-01	o	BRACKET, FR DETECTION
341	3-701-437-21	s	WASHER, POLY 2MM DIA., 0.5T
342	3-701-438-11	s	WASHER, POLY 2.5MM DIA., 0.25T
343	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
344	3-701-505-00	s	SET SCREW, DOUBLE POINT 3x3
345	3-701-506-01	s	SET SCREW, DOUBLE POINT 3x4
346	3-703-074-00	s	CAP 3, SHAFT
347	3-703-075-00	s	CAP 2, SHAFT
348	8-835-055-01	s	MOTOR, DC (DNR-47OOA)

5. THREADING ARM


401
402
408
432
412
432
SET SCREW3×3
(FLAT POINT)
426
430
431
423
421
422
SET SCREW3×4
(FLAT POINT)
S drawer roller
drawer lever
PWH 3×6
406
409
414
E-3
PWH 3×6
428
417
419
433
B 3x10
B3×4
411
432
413
432
SET SCREW 3x3
(FLAT POINT)
SET SCREW 3x5
(FLAT POINT)
415
BV
3×10
418
PSW 3x8
427
403
410
404
T drawer arm
433
407
425
E-3
PWH
3×6
424
PTTWH 3x6
405
PTTWH 3x6
416
420
S drawer arm
429
PSW3×6

No.	Part No.	SP	Description
401	A-6746-021-B	s	ROLLER BLOCK ASS'Y, S DRAWER
402	A-6746-034-A	s	ROLLER BLOCK ASS'Y (2), DRAWER
403	A-6746-045-A	s	ROLLER BLOCK ASS'Y, T GUIDE
404	A-6750-200-A	o	ARM BLOCK ASS'Y, T DRAWER
405	A-6750-201-A	o	ARM BLOCK ASS'Y, S DRAWER
406	A-6750-202-A	o	LEVER BLOCK ASS'Y, DRAWER
407	X-3668-711-0	o	ARM ASS'Y, S DRAWER
408	X-3668-712-3	s	SHAFT (2) ASS'Y, ROLLER
409	X-3668-713-0	o	LINK (B) ASS'Y, DRIVING
410	X-3668-714-0	o	RETAINER ASS'Y, ART, T DRAWER
411	X-3668-716-0	s	SHAFT (3) ASS'Y, ROLLER
412	X-3668-718-0	s	GUIDE ASS'Y, TAPE
413	X-3668-727-0	o	GUIDE ASS'Y, TAPE
414	X-3668-729-0	s	LEVER ASS'Y, DRAWER
415	X-3672-705-1	o	PLATE ASS'Y, GUIDE, T
416	X-3672-706-1	o	BASE ASS'Y, S DRAWER ARM
417	X-3672-708-1	o	ARM ASS'Y, T DRAWER
418	1-603-435-00	o	PRINTED CIRCUIT BOARD, SW-50
419	3-534-854-00	s	SPRING, COMPRESSION
420	3-540-506-00	s	SPRING, TENSION
421	3-644-718-00	s	SPRING, COMPRESSION
422	3-668-718-00	s	RETAINER, SPRING, S DRAWER
423	3-668-719-00	s	HOLDER (L), S GUIDE
424	3-668-720-00	o	LIMITER, S DRAWER
425	3-668-721-00	s	ARM, S DRIVING
426	3-668-724-00	o	FLANGE (2), LOWER
427	3-668-734-00	o	SPRING
428	3-668-735-00	s	RETAINER, SPRING
429	3-668-760-00	o	SHAFT, DRAWER LEVER
430	3-668-833-00	s	HOLDER (M), GUIDE, S
431	3-669-946-00	s	RING (P4), 0
432	3-701-438-01	s	WASHER, POLY 2.5MM DIA., 0.13T
433	3-703-074-00	s	CAP 3, SHAFT

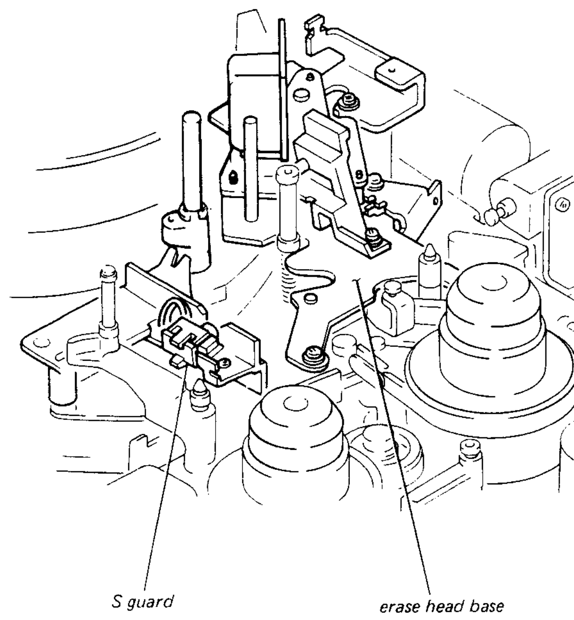
6. DRUM AND CAPSTAN BLOCKS

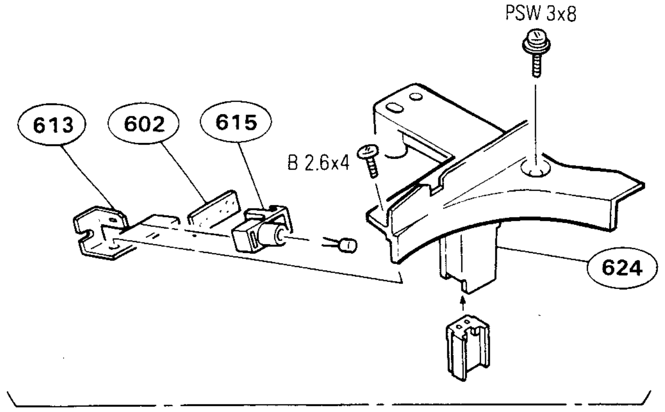

head drum
P 4×12
P 4x12
LW, 4mm dia.
LW, 4mm dia.
528
527
PSW 3×12
523
516
502
PSW3×8
522
519
PWH 2.6×5
PS 4×12
PS 3×12
503
517
PSW2.6×12
PSW3×6
526
PWH 3×6
512
507
508
W, 3mm dia.
PWH 3×6
SET SCREW 3x8
P 3x10
(CORN POINT)
510
511
P 3x10
PS 2.6x6
509
518
B2 6×6
514
SET SCREW 3x6
506
524
521
501
515
525
SET SCREW 3x6
506
524
504
520
505
505
513
audio/CTL head

VP-5020 (1)

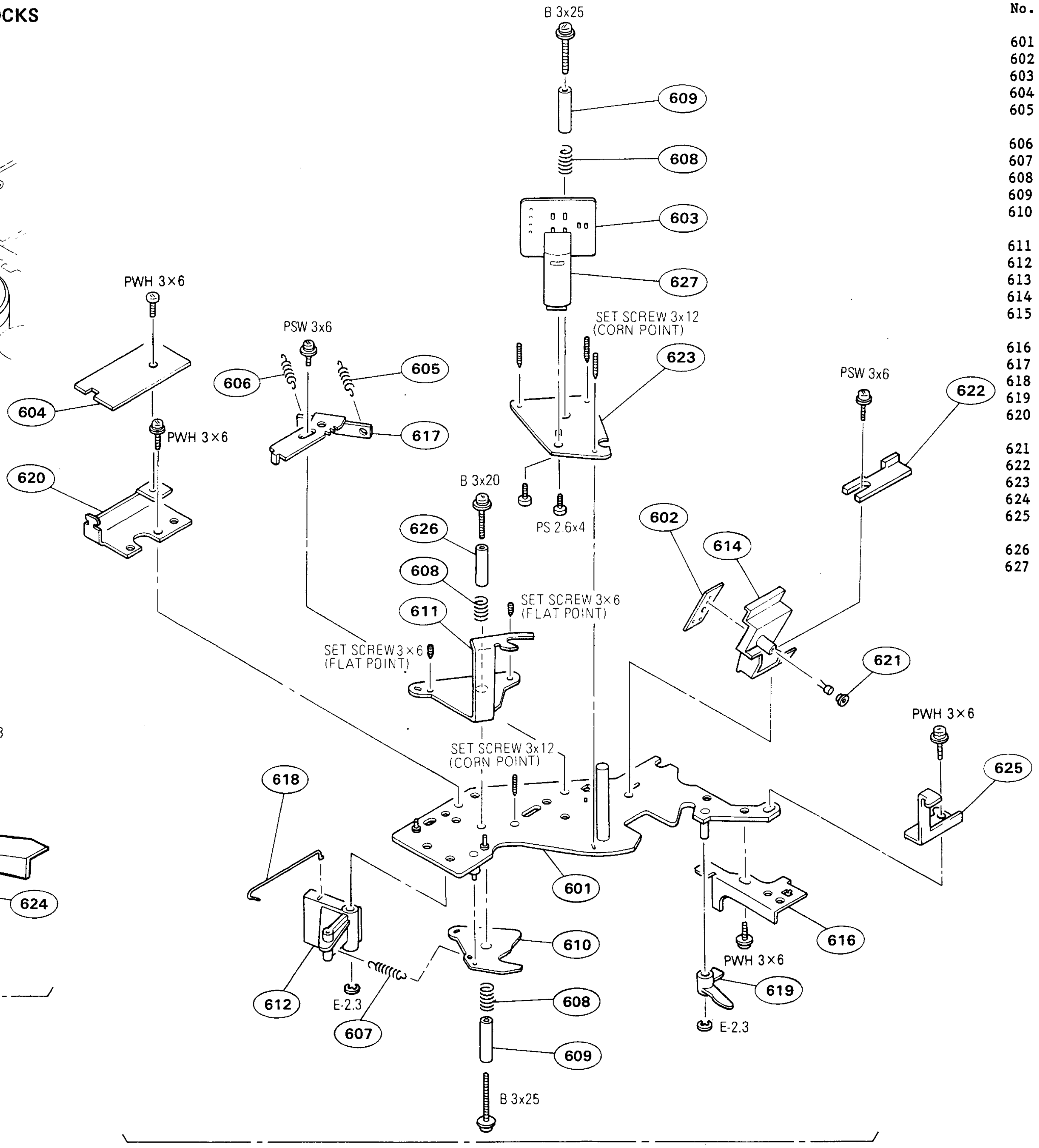
No.	Part No.	SP	Description
501	1-618-602-00	o	PRINTED CIRCUIT BOARD, AH-11
502	1-586-633-00	s	DETECTOR, DEW
503	1-605-018-00	o	PRINTED CIRCUIT BOARD, PT-9
504	3-641-612-00	s	GUIDE, TAPE
505	3-641-615-00	s	SPRING, COMPRESSION
506	3-641-616-00	s	NUT, TAPE GUIDE ADJUSTMENT
507	3-641-621-00	s	SCREW, HEAD ADJUSTING
508	3-641-622-00	s	SPRING, COMPRESSION
509	3-641-640-00	o	BRACKET, (1), C.T.L. HEAD
510	3-641-641-02	o	BRACKET, C.T.L. HEAD, (2)
511	3-645-076-00	o	WASHER, M-REEL S
512	3-647-815-00	o	PLATE, ADJUSTMENT, CTL HEAD
513	3-647-816-00	o	POLE, SUPPORT, CTL BRACKET
514	3-650-301-00	o	COVER, HEAD, D-CTL
515	3-650-302-00	o	COVER, HEAD (REAR)
516	3-655-631-00	o	TERMINAL, GROUND
517	3-669-904-00	o	HOLDER, PT
518	3-669-985-00	o	PLATE, ADJUSTMENT
519	3-672-729-01	s	TG-2
520	3-672-730-01	s	TG-3
521	3-672-731-01	s	TG-4
522	3-672-762-01	o	PIN, DRUM
523	3-672-763-01	o	CAM, P OFFSET PREVENTION
524	3-688-807-01	s	FLANGE, TAPE GUIDE
525	8-829-358-41	s	HEAD (PP150-5803B)
526	8-835-177-01	s	MOTOR, DC BHF-1915A
527	A-6709-558-A	s	HEAD DRUM ASS'Y, DUH-37A-R
528	A-6709-560-A	s	UPPER DRUM ASS'Y, DUR-37-R

7. ERASE HEAD BASE AND S GUARD BLOCKS


S guard
erase head base


PSW 3x8
613
602
615
B 2.6x4
624

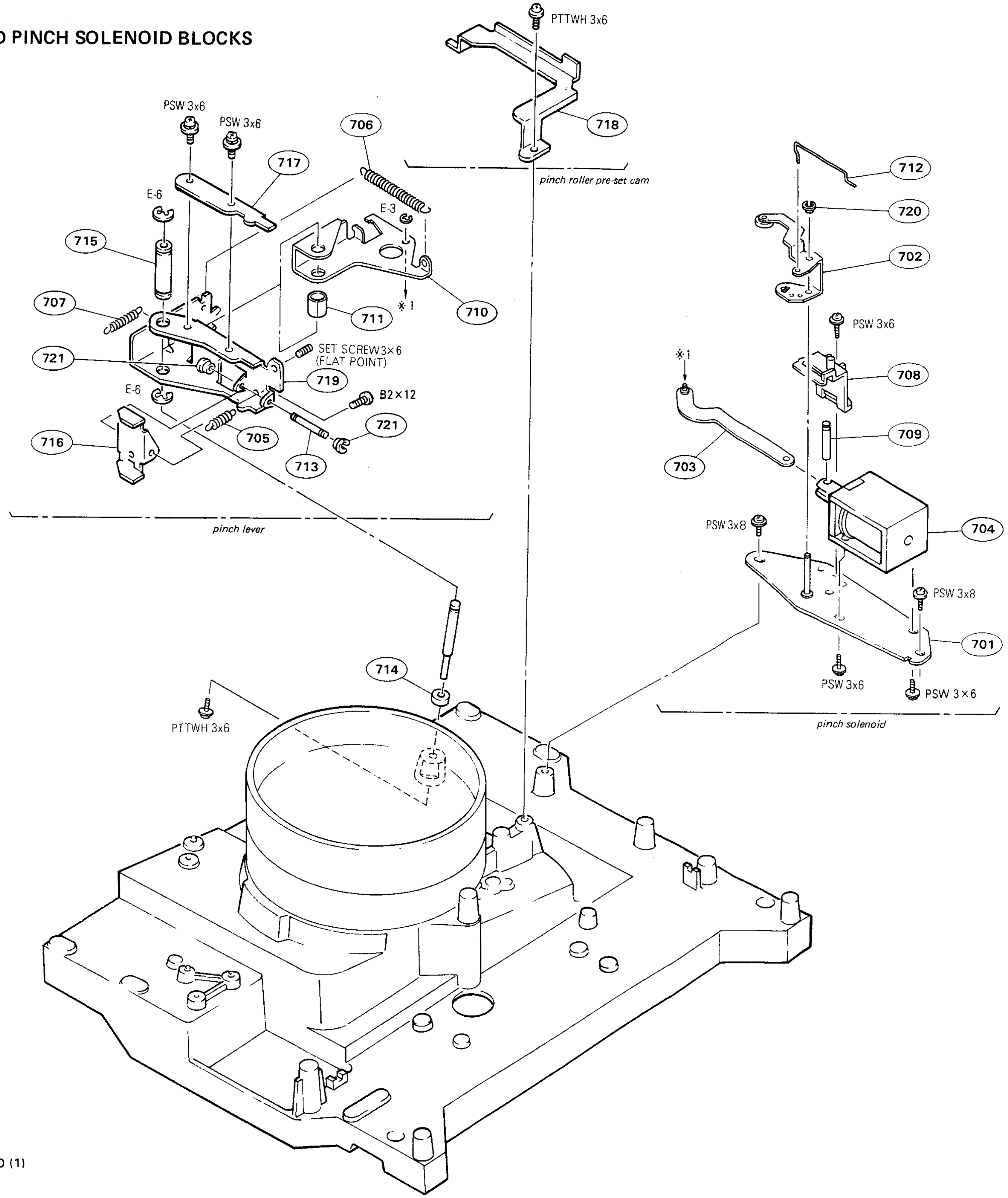
S guard


B 3x25
609
608
603
627
SET SCREW 3x12
(CORN POINT)
623
PWH 3×6
PSW 3x6
606
605
604
617
PWH 3×6
620
B 3x20
PS 2.6x4
626
608
611
SET SCREW 3×6
(FLAT POINT)
SET SCREW 3×6
(FLAT POINT)
602
614
PSW 3x6
622
621
PWH 3×6
625
SET SCREW 3x12
(CORN POINT)
618
601
616
610
612
E-2.3
607
608
609
PWH 3×6
619
E-2.3
B 3x25

erase head base

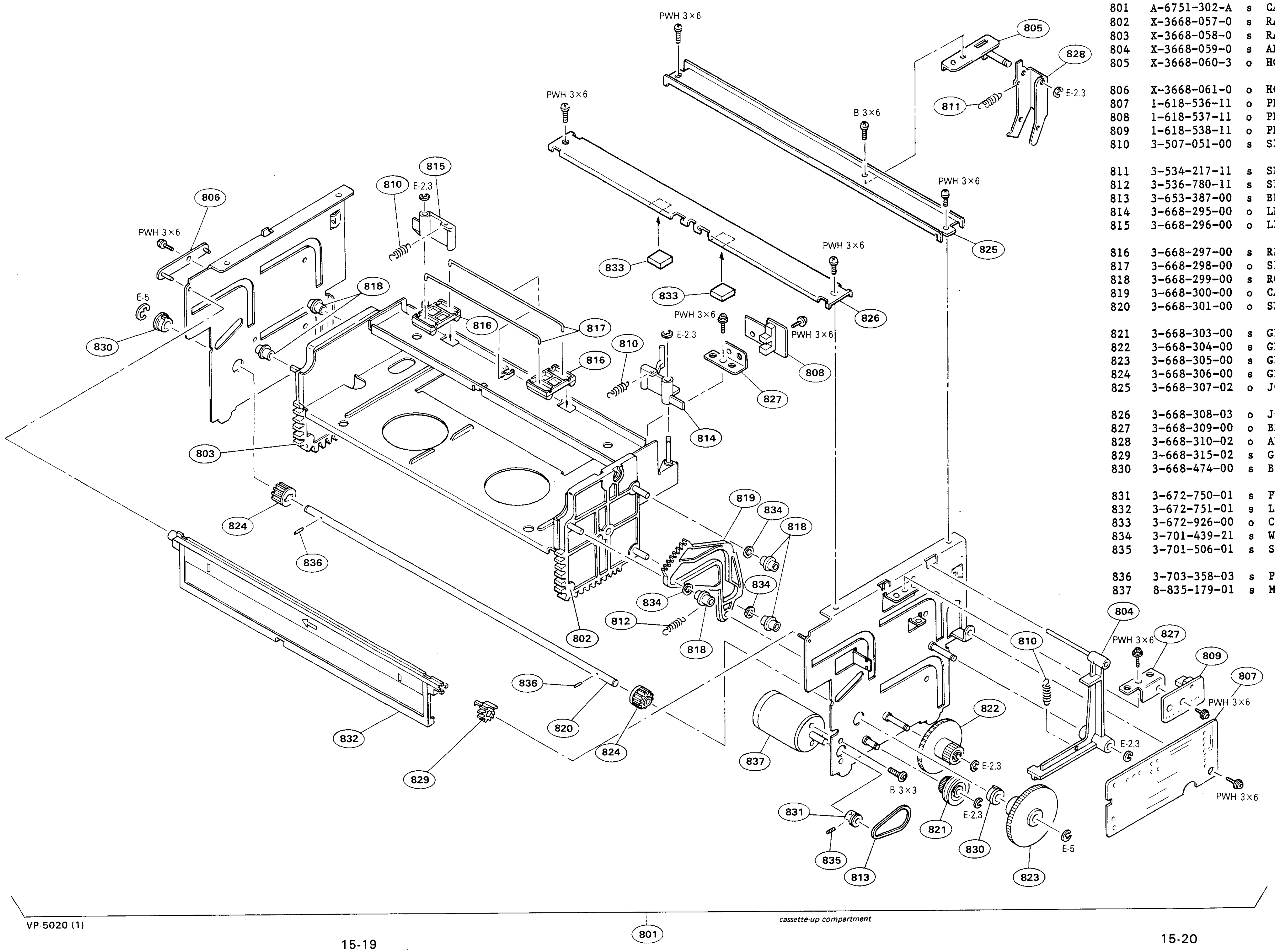
No.	Part No.	SP	Description
601	X-3668-728-0	o	DECK ASS'Y, E HEAD
602	1-603-737-00	o	PRINTED CIRCUIT BOARD, PH-5
603	1-618-535-11	o	PRINTED CIRCUIT BOARD, EC-23
604	1-618-602-11	o	PRINTED CIRCUIT BOARD, AH-11
605	3-534-238-XX	s	SPRING, TENSION (23T)
606	3-538-102-00	s	SPRING, TENSION
607	3-630-615-XX	s	SPRING, TENSION (18T)
608	3-637-335-00	s	SPRING, COMPRESSION (C)
609	3-657-086-01	o	SPACER (3 x 20)
610	3-668-705-00	s	HOLDER (LOWER), S
611	3-668-706-00	s	HOLDER (UPPER), S
612	3-668-708-00	o	ARM, DRIVING, CORRECTION GUIDE
613	3-668-809-02	o	BRACKET, HOLDER
614	3-668-832-02	o	HOLDER (S)
615	3-668-837-00	o	HOLDER, LED
616	3-668-859-00	o	STOPPER, RING
617	3-668-860-00	o	HOOK, SPRING, TENSION REGULATOR
618	3-668-884-03	o	JOINT, RESERVE PRESS
619	3-668-894-00	o	LEVER, RELEASE
620	3-668-962-00	o	BRACKET, AH PC BOARD
621	3-669-920-00	o	COVER, S PHOTO
622	3-669-964-00	o	PLATE, GROUND
623	3-672-723-00	o	TABLE, HEAD, E
624	3-672-764-01	s	GUARD, S
625	3-710-804-01	o	SPRING
626	4-855-006-11	s	SPACER (3 x 14)
627	8-825-514-20	s	HEAD, CTL (PP170-58)

8. PINCH LEVER AND PINCH SOLENOID BLOCKS


PTTWH 3x6
718
pinch roller pre-set cam
PSW 3x6
PSW 3x6
706
717
E-6
715
E-3
710
707
711
※1
721
SET SCREW3×6
(FLAT POINT)
719
B2×12
E-6
721
705
716
713
pinch lever
712
720
702
PSW 3x6
※1
708
709
703
704
PSW 3x8
PSW 3x8
701
PSW 3x6
PSW 3×6
pinch solenoid
714
PTTWH 3x6

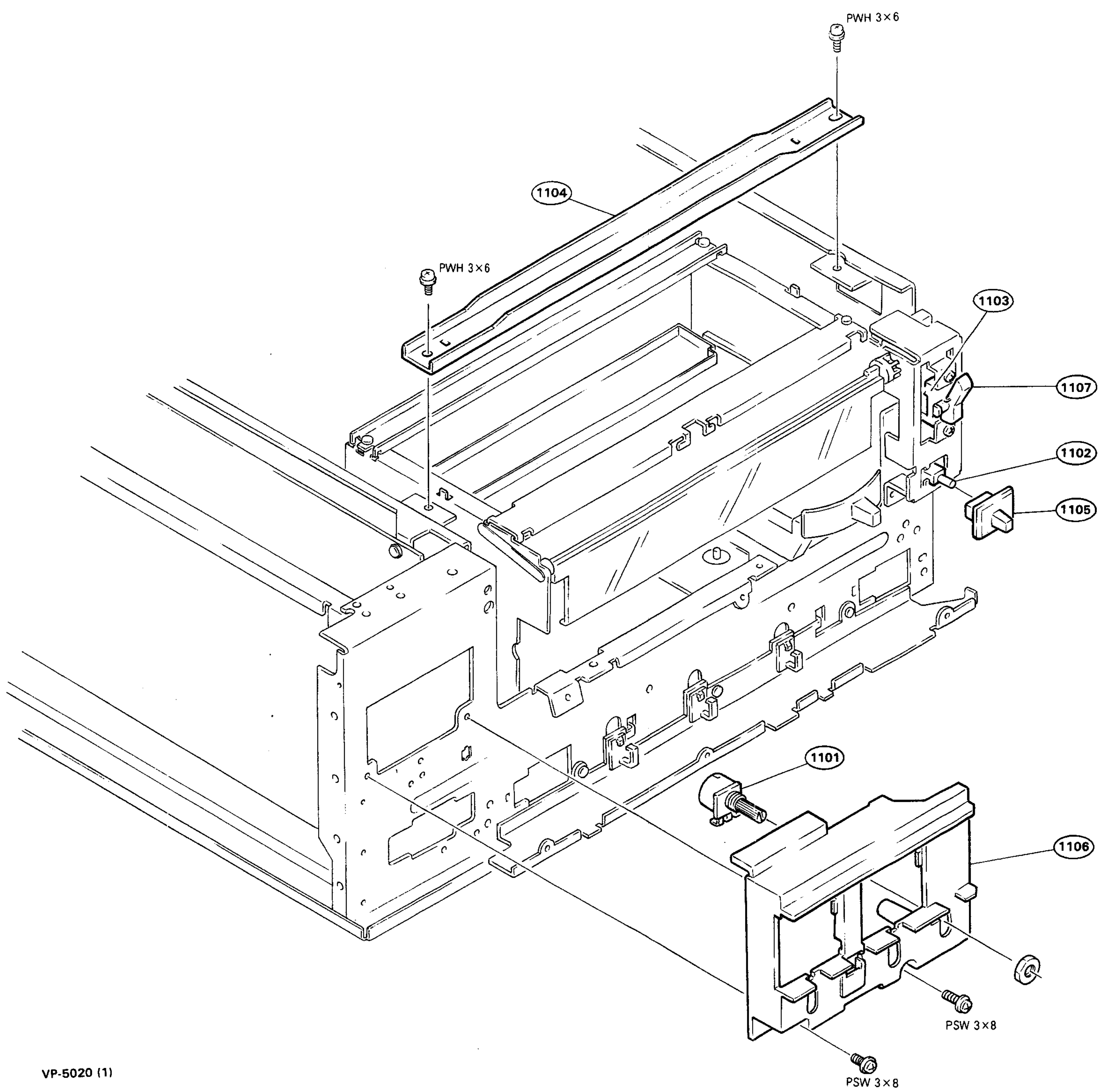
No.	Part No.	SP	Description
701	X-3668-734-0	o	BASE ASS'Y, PINCH PRESS
702	X-3668-735-3	s	LEVER, ASS'Y, RESERVE PRESS
703	X-3668-736-0	o	JOINT ASS'Y
704	1-454-416-11	s	SOLENOID, PLUNGER
705	2-202-432-01	s	SPRING (B), COMPRESSION
706	3-610-265-02	s	SPRING
707	3-645-392-00	s	SPRING, TENSION
708	3-668-863-00	s	GUIDE, ARBOR
709	3-668-864-00	s	PIN, SOLENOID
710	3-668-865-00	o	LEVER (B), PINCH PRESS
711	3-668-867-00	o	SPACER (8 x 9)
712	3-668-884-03	o	JOINT, RESERVE PRESS
713	3-668-895-00	o	SHAFT
714	3-672-733-01	o	TABLE, SHAFT, PRESS LEVER
715	3-672-734-01	o	SLEEVE, PINCH PRESS LEVER
716	3-672-773-01	o	PLATE, PRESS PINCH
717	3-672-774-01	o	PLATE, ADJUSTMENT, P PRESS
718	3-672-789-01	o	DECK, PRESS, RESERVE
719	3-672-791-01	o	LEVER (A), PINCH PRESS
720	3-703-074-00	s	CAP 3, SHAFT
721	3-703-075-00	s	CAP 2, SHAFT

9. CASSETTE-UP COMPARTMENT BLOCK


PWH 3×6
805
828
E-2.3
811
B 3×6
PWH 3×6
PWH 3×6
815
810
E-2.3
806
PWH 3×6
825
PWH 3×6
833
833
818
E-5
PWH 3×6
E-2.3
826
816
817
PWH 3×6
808
830
810
816
827
814
803
819
834
818
824
834
836
834
812
802
818
804
PWH 3×6
827
810
809
807
PWH 3×6
836
822
820
837
E-2.3
E-2.3
832
824
B 3×3
829
831
E-2.3
821
830
E-5
PWH 3×6
835
813
823
cassette-up compartment
801

No.	Part No.	SP	Description
801	A-6751-302-A	s	CASSETTE-UP BLOCK ASS'Y
802	X-3668-057-0	s	RACK ASS'Y, CASSETTE COMPARTMENT
803	X-3668-058-0	s	RACK ASS'Y, CASSETTE COMPARTMENT
804	X-3668-059-0	s	ARM ASS'Y, SWITCH DOWN
805	X-3668-060-3	o	HOLDER ASS'Y, ARM
806	X-3668-061-0	o	HOLDE ASS'Y, LID
807	1-618-536-11	o	PRINTED CIRCUIT BOARD, CC-22
808	1-618-537-11	o	PRINTED CIRCUIT BOARD, CC-23
809	1-618-538-11	o	PRINTED CIRCUIT BOARD, CC-24
810	3-507-051-00	s	SPRING, TENSION
811	3-534-217-11	s	SPRING, TENSION
812	3-536-780-11	s	SPRING, TENSION
813	3-653-387-00	s	BELT, LM
814	3-668-295-00	o	LEVER (RIGHT), CASSETTE PUSH-OUT
815	3-668-296-00	o	LEVER (LEFT), CASSETTE PUSH-OUT
816	3-668-297-00	s	RETAINER, CASSETTE
817	3-668-298-00	o	SPRING
818	3-668-299-00	s	ROLLER, GUIDE
819	3-668-300-00	o	CAM, LID OPEN
820	3-668-301-00	o	SHAFT, DRIVING
821	3-668-303-00	s	GEAR (A)
822	3-668-304-00	s	GEAR (B)
823	3-668-305-00	s	GEAR (C)
824	3-668-306-00	s	GEAR (D)
825	3-668-307-02	o	JOINT (R), LEFT & RIGHT
826	3-668-308-03	o	JOINT (F), LEFT & RIGHT
827	3-668-309-00	o	BRACKET, SWITCH
828	3-668-310-02	o	ARM, LID OPEN
829	3-668-315-02	s	GEAR, LID
830	3-668-474-00	s	BEARING (6)
831	3-672-750-01	s	PULLEY (C), MOTOR
832	3-672-751-01	s	LID, CASSETTE
833	3-672-926-00	o	CUSHION, LID
834	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
835	3-701-506-01	s	SET SCREW, DOUBLE POINT 3 x 4
836	3-703-358-03	s	PIN, PARALLEL (DIA. 2 x 8)
837	8-835-179-01	s	MOTOR, DC MCB 2B15

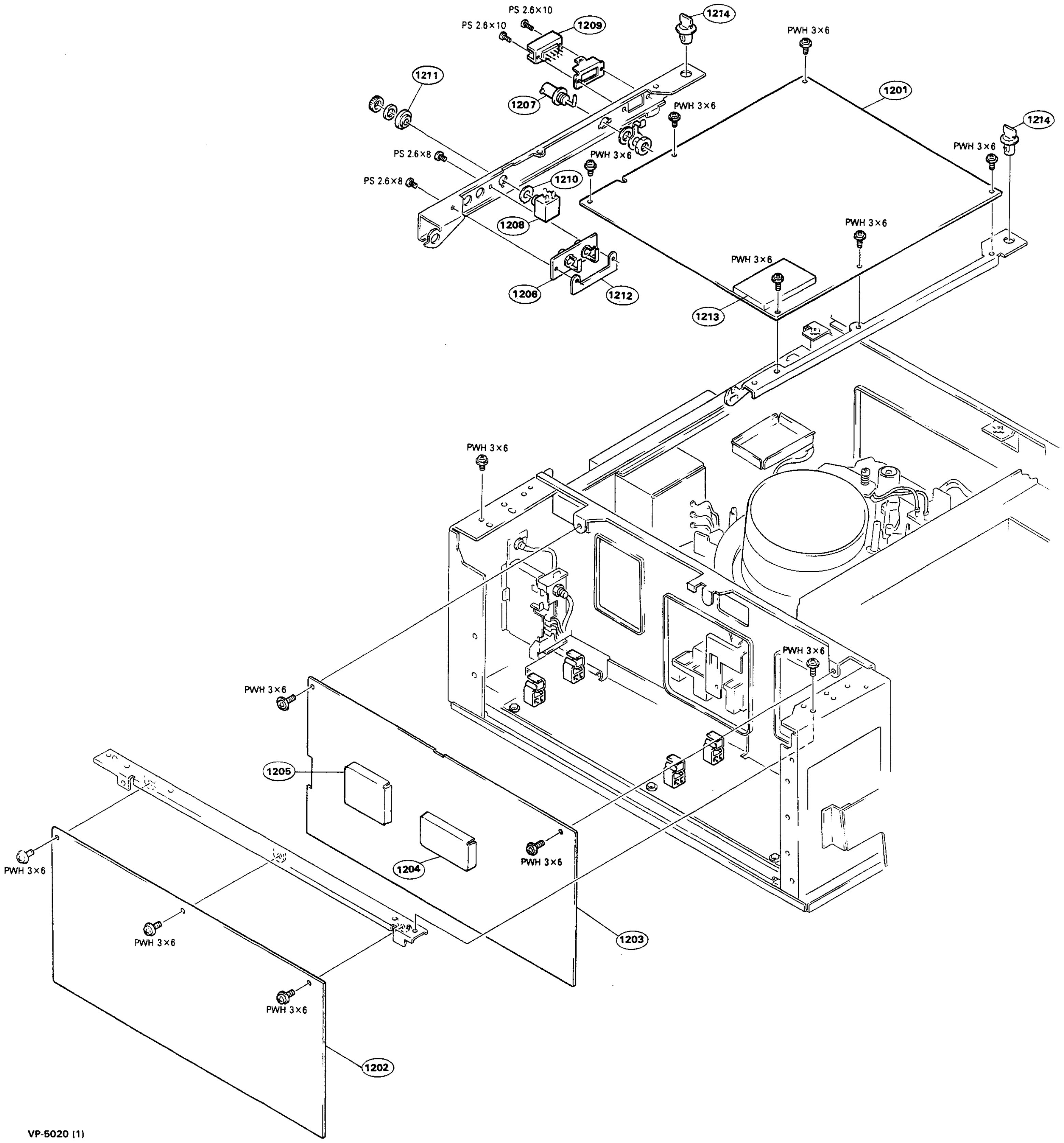
12. CHASSIS BLOCK (1)


PWH 3×6
1104
PWH 3×6
1103
1107
1102
1105
1101
1106
PSW 3×8
PSW 3×8

VP-5020 (1)

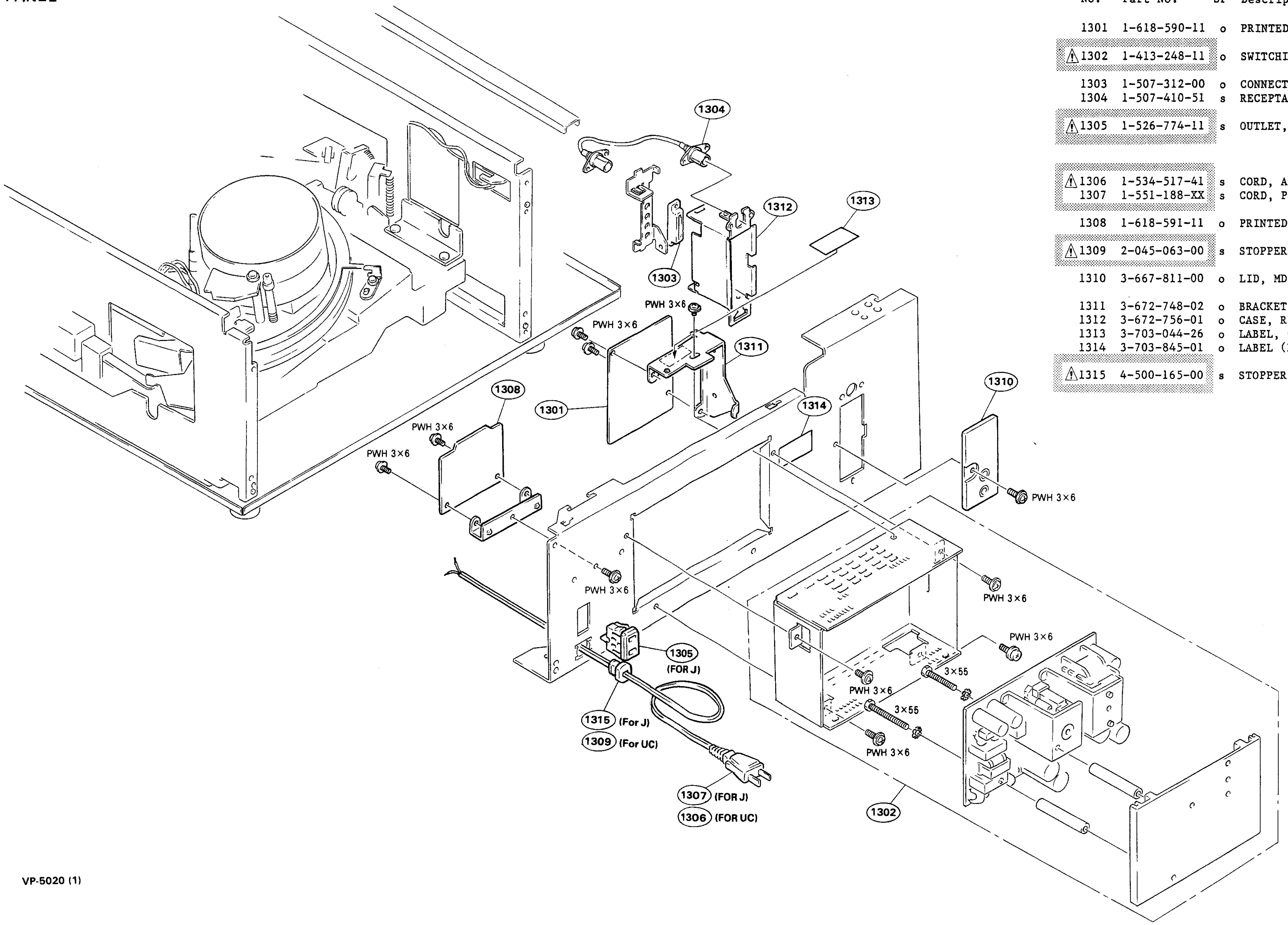
No.	Part No.	SP	Description	
1101	1-237-215-11	s	RES, VAR, CARBON 100K	ARD KY-91
1102	1-552-271-00	s	SWITCH, SLIDE	
⚠1103	1-570-117-31	s	SWITCH, LOCKER (AC POWER)	
1104	3-672-765-01	o	BRACKET, C	
1105	3-672-781-01	s	KNOB, SLIDE SWITCH	
1106	3-672-795-01	o	PANEL, METER	
1107	3-688-814-01	s	CAP, SWITCH	

13. CHASSIS BLOCK (2)


PS 2.6×10
PS 2.6×10
1209
1214
PWH 3×6
1211
1207
1201
PWH 3×6
1214
PWH 3×6
PS 2.6×8
PWH 3×6
PS 2.6×8
1210
1208
PWH 3×6
PWH 3×6
1206
1212
1213
PWH 3×6
PWH 3×6
PWH 3×6
1205
PWH 3×6
PWH 3×6
1204
PWH 3×6
1203
PWH 3×6
1202
VP-5020 (1)

No.	Part No.	SP	Description
1201	A-6711-754-A	o	MOUNTED CIRCUIT BOARD, VA-35
⚠ 1202	A-6715-323-A	o	MOUNTED CIRCUIT BOARD, SV-74
⚠ 1203	A-6717-433-A	o	MOUNTED CIRCUIT BOARD, SY-51
1204	3-710-812-01	o	LID (A), SY SHIELD
1205	3-710-813-01	o	LID (B), SY SHIELD
1206	1-563-353-11	s	JACK, PIN (RCA) 2P
1207	1-563-354-11	s	CONNECTOR, BNC
1208	1-563-355-11	s	JACK, MINIATURE
1209	1-563-356-11	s	CONNECTOR, MULTI 8P
1210	3-437-228-00	s	INSULATOR, JACK
1211	3-437-229-01	s	INSULATOR (B), JACK
1212	3-672-747-01	o	BRACKET, JACK, 2PRCA
1213	3-710-816-01	o	CASE (VH) (M), SHIELD
1214	3-710-825-01	o	FASTENER, PLATE

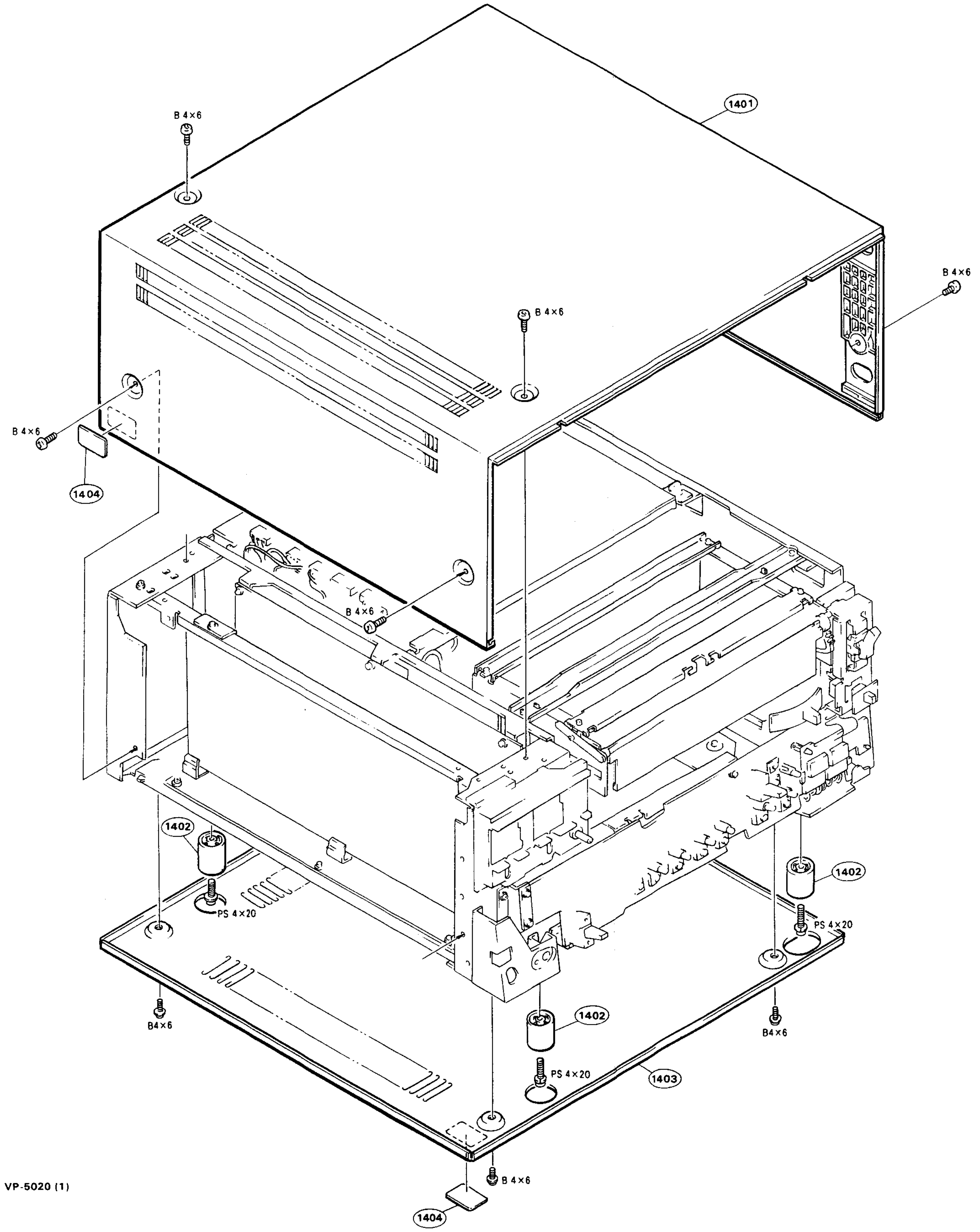
14. REAR PANEL


1304
1312
1313
1303
PWH 3×6
PWH 3×6
1311
1308
1301
1314
1310
PWH 3×6
PWH 3×6
PWH 3×6
PWH 3×6
PWH 3×6
PWH 3×6
1305
(FOR J)
3×55
PWH 3×6
3×55
1315 (For J)
1309 (For UC)
PWH 3×6
1307 (FOR J)
1306 (FOR UC)
1302

VP-5020 (1)

No.	Part No.	SP	Description
1301	1-618-590-11	o	PRINTED CIRCUIT BOARD, DC-24
⚠1302	1-413-248-11	o	SWITCHING REGULATOR (UR-14)
1303	1-507-312-00	o	CONNECTOR P.C.B.
1304	1-507-410-51	s	RECEPTACLE (F TYPE)
⚠1305	1-526-774-11	s	OUTLET, AC (FOR J)
⚠1306	1-534-517-41	s	CORD, AC (FOR UC)
1307	1-551-188-XX	s	CORD, POWER (FOR J)
1308	1-618-591-11	o	PRINTED CIRCUIT BOARD, AC-65
⚠1309	2-045-063-00	s	STOPPER, CORD (FOR UC)
1310	3-667-811-00	o	LID, MD
1311	3-672-748-02	o	BRACKET, DC
1312	3-672-756-01	o	CASE, RF
1313	3-703-044-26	o	LABEL, CAUTION (FOR UC)
1314	3-703-845-01	o	LABEL (N) (U/C), MAIN CAUTION (FOR UC)
⚠1315	4-500-165-00	s	STOPPER, CORD (FOR J)

15. ORNAMENTAL PANEL BLOCK


B 4×6
1401
B 4×6
B 4×6
B 4×6
1404
B 4×6
1402
PS 4×20
1402
PS 4×20
B4×6
1402
B4×6
PS 4×20
1403
B 4×6
1404

VP-5020 (1)

No.	Part No.	SP	Description
1401	X-3672-719-1	o	CASE ASS'Y, U
1402	X-4838-902-1	s	LEG
1403	3-672-766-01	o	BOARD, BOTTOM
1404	3-703-848-01	o	LABEL (N), SUB CAUTION (FOR UC)

15-3. ELECTRICAL PARTS LIST

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□, CT□□	CAPACITOR	IC□□	IC	Q□□	TRANSISTOR
CF□□	CERAMIC FILTER	J□□	JACK	R□□, RV□□	RESISTOR
CN□□	CONNECTOR	L□□	INDUCTOR	RY□□	RELAY
D□□	DIODE	M□□	MOTOR	S□□, SW□□	SWITCH
DL□□	DELAY LINE	ME□□	METER	SB□□	SOLAR BATTERY
F□□	FUSE	MIC□□	MICROPHONE	T□□	TRANSFORMER
FB□□	FERRITE BEAD	PG□□	PG COIL	TH□□	THERMISTOR
FL□□	FILTER	PL□□	LAMP	X□□	CRYSTAL
H□□	HEAD	PM□□	SOLENOIDE		

All capacitors are in micro farads unless otherwise specified.

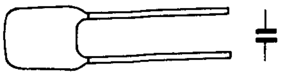
All inductors are in micro henries unless otherwise specified.

All resistors are in ohms.

Parts that are not listed in the "reference numbers order list" are shown
in following table.
Reference numbers are omitted.

CAPACITOR

MYLAR CAPACITOR



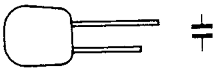
0.00047μF through 0.22μF
±5% 50WV

Parts No. 1-130-□□□-00

Value	Parts No. —□□□—
0.00047μF	467
0.00056	468
0.00068	469
0.00082	470
0.001	471
0.0012	472
0.0015	473
0.0018	474
0.0022	475
0.0027	476
0.0033	477
0.0039μF	478
0.0047	479
0.0056	480
0.0068	481
0.0082	482
0.01	483
0.012	484
0.015	485
0.018	486
0.022	487
0.027	488
0.033μF	489
0.039	490
0.047	491
0.056	492
0.068	493
0.082	494
0.1	495
0.12	496
0.15	497
0.18	498
0.22	499

SILVERED MICA CAPACITOR

1 pF through 620 pF
± 5%, 50WV



Parts No. 1-107-□□□-00

Value	Parts No. –□□□–
1 pF	098
2	099
3	100
4	101
5	102
6	103
7	104
8	105
9	106
10	061
11	062
12	063
13	064

Value	Parts No. –□□□–
15 pF	065
16	066
18	067
20	068
22	069
24	070
27	071
30	072
33	073
36	074
39	075
43	076
47	077

Value	Parts No. –□□□–
51 pF	078
56	079
62	080
68	081
75	082
82	083
91	084
100	085
110	086
120	087
130	088
150	089
160	090

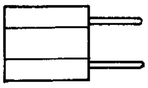
Value	Parts No. –□□□–
180 pF	091
200	092
220	093
240	094
270	095
300	096
330	097
360	231
390	232
430	233
470	234
510	235
560	236
620	237

INDUCTOR

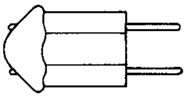
MICRO INDUCTOR

1 μH through 470 μH
±5%

-21



-00



Parts No. 1-408-□□□-□□

Value	Parts No. –□□□–
1 μH	397
1.2	398
1.5	399
1.8	400
2.2	401
2.7	402
3.3	403
3.9	404

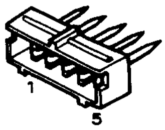
Value	Parts No. –□□□–
4.7 μH	405
5.6	406
6.8	407
8.2	408
10	409
12	410
15	411
18	412

Value	Parts No. –□□□–
22 μH	413
27	414
33	415
39	416
47	417
56	418
68	419
82	420

Value	Parts No. –□□□–
100 μH	421
120	422
150	423
180	424
220	425
270	426
330	427
390	428
470	429

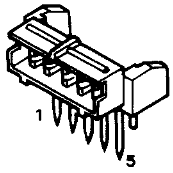
CONNECTOR

top-type connector



2P	
3P	1-506-726-11
4P	
5P	727-11
6P	728-11
7P	
8P	729-11
9P	
10P	732-11
11P	
12P	733-11

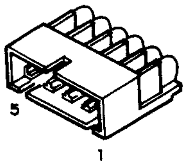
side-type connector



2P	
3P	1-506-734-11
4P	
5P	735-11
6P	736-11
7P	
8P	737-11
9P	
10P	738-11
11P	
12P	739-11

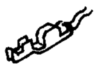
connector

housing



2P	
3P	1-563-242-11
4P	
5P	243-11
6P	244-11
7P	
8P	245-11
9P	
10P	246-11
11P	
12P	247-11

contact

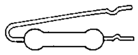


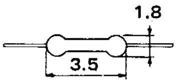
1-563-240-21 (AGW22 ~ 26)
1-563-241-21 (AGW26 ~ 30)

RESISTOR

CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ





Parts No. 1-247-□□□-00

Value	Parts No. −□□□−
1Ω	–
1.1	–
1.2	–
1.3	–
1.5	–
1.6	–
1.8	–
2	–
2.2	767
2.4	768
2.7	769
3	770
3.3	771
3.6	772
3.9	773
4.3	774
4.7	775
5.1	776
5.6	777
6.2	778
6.8	779
7.5	780
8.2	781
9.1	782
10Ω	783
11	784
12	785
13	786
15	787
16	788
18	789
20	790
22	791
24	792
27	793
30	794
33	795

Value	Parts No. −□□□−
36Ω	796
39	797
43	798
47	799
51	800
56	801
62	802
68	803
75	804
82	805
91	806
100Ω	807
110	808
120	809
130	810
150	811
160	812
180	813
200	814
220	815
240	816
270	817
300	818
330	819
360	820
390	821
430	822
470	823
510	824
560	825
620	826
680	827
750	828
820	829
910	830
1kΩ	831
1.1	832

Value	Parts No. −□□□−
1.2kΩ	833
1.3	834
1.5	835
1.6	836
1.8	837
2	838
2.2	839
2.4	840
2.7	841
3	842
3.3	843
3.6	844
3.9	845
4.3	846
4.7	847
5.1	848
5.6	849
6.2	850
6.8	851
7.5	852
8.2	853
9.1	854
10kΩ	855
11	856
12	857
13	858
15	859
16	860
18	861
20	862
22	863
24	864
27	865
30	866
33	867
36	868
39	869

Value	Parts No. −□□□−
43kΩ	870
47	871
51	872
56	873
62	874
68	875
75	876
82	877
91	878
100kΩ	879
110	880
120	881
130	882
150	883
160	884
180	885
200	886
220	887
240	888
270	889
300	890
330	891
360	892
390	893
430	894
470	895
510	896
560	897
620	898
680	899
750	900
820	901
910	902
1MΩ	903

Ref.No.	Parts No.	SP	Description
AC-65 BOARD			
	1-618-591-11	o	PRINTED CIRCUIT BOARD,AC-65
	1-533-189-11	s	HOLDER,FUSE
⚠ CN1	1-506-371-00	o	2P PLUG (L)
	1-509-910-00	o	HOUSING,2P
	1-509-898-00	o	CONTACT
⚠ F1	1-532-743-11	s	2A,250V
AH-11 BOARD			
	1-618-602-11	o	PRINTED CIRCUIT BOARD,AH-11
CC-22 BOARD			
	1-618-536-11	o	PRINTED CIRCUIT BOARD,CC-22
R1	1-246-459-00	s	CARBON 270 5% 1/4W
R2	1-246-481-00	s	CARBON 2.2k 5% 1/4W
R3	1-246-459-00	s	CARBON 270 5% 1/4W
R4	1-246-481-00	s	CARBON 2.2k 5% 1/4W
CC-23 BOARD			
	1-618-537-11	o	PRINTED CIRCUIT BOARD,CC-23
IC1	8-719-104-42	s	PS4005-L
CC-24 BOARD			
	1-618-538-11	o	PRINTED CIRCUIT BOARD,CC-24
IC1	8-719-104-42	s	PS4005-L

Ref.No.	Parts No.	SP	Description
DC-24 BOARD			
	1-618-590-11	o	PRINTED CIRCUIT BOARD,DC-24
⚠ F1	1-532-745-11	s	3.15A,250V
F2	1-532-744-11	s	2.5A,250V
EC-23 BOARD			
	1-618-535-11	o	PRINTED CIRCUIT BOARD,EC-23
KY-91 BOARD			
	A-6717-435-A	o	MOUNTED CIRCUIT BOARD,KY-91
C1	1-161-059-00	s	CERAMIC 0.047 10% 50V
C3	1-161-059-00	s	CERAMIC 0.047 10% 50V
C6	1-161-059-00	s	CERAMIC 0.047 10% 50V
C7	1-124-892-11	s	ELECT 47 20% 50V
C8	1-124-443-00	s	ELECT 100 20% 10V
C9	1-124-443-00	s	ELECT 100 20% 10V
C10	1-162-211-31	s	CERAMIC 33PF 5% 50V
C11	1-162-211-31	s	CERAMIC 33PF 5% 50V
CN701	1-807-441-11	s	BLOCK,DISPLAY(A)
D1	8-719-904-55	s	GL-5HD5
D2	8-719-911-19	s	1SS119
D3	8-719-911-19	s	1SS119
D5	8-719-911-19	s	1SS119
D6	8-719-911-19	s	1SS119
D7	8-719-911-19	s	1SS119
D9	8-719-911-19	s	1SS119
D10	8-719-911-19	s	1SS119
D11	8-719-911-19	s	1SS119
D12	8-719-911-19	s	1SS119
D13	8-719-911-19	s	1SS119
D14	8-719-911-19	s	1SS119
D16	8-719-911-19	s	1SS119
D17	8-719-911-19	s	1SS119
D20	8-719-904-55	s	GL-5HD5
D21	8-719-904-55	s	GL-5HD5
D22	8-719-904-55	s	GL-5HD5
D23	8-719-905-54	s	EBG5504S
D24	8-719-904-55	s	GL-5HD5
D25	8-719-904-55	s	GL-5HD5

Ref.No.			
D28	8-719-905-55	s	EAA5504S
D29	8-719-905-55	s	EAA5504S
D33	8-719-911-19	s	1SS119
IC1	8-759-927-42	s	MB8851H-1015M(FUJITSU)
IC2	8-759-987-47	s	MB8747(FUJITSU)
IC3	8-759-645-16	s	M54516P(MITSUBISHI)
L1	1-407-488-00	s	470
Q1	8-729-117-54	s	2SA1175
Q2	8-729-117-54	s	2SA1175
Q3	8-729-117-54	s	2SA1175
Q4	8-729-117-54	s	2SA1175
Q5	8-729-117-54	s	2SA1175
Q6	8-729-117-54	s	2SA1175
Q7	8-729-117-54	s	2SA1175
Q8	8-729-117-54	s	2SA1175
Q9	8-729-900-67	s	DTA124XS
Q10	8-729-900-67	s	DTA124XS
Q11	8-729-900-67	s	DTA124XS
Q12	8-729-900-67	s	DTA124XS
Q13	8-729-900-89	s	DTC144ES
Q14	8-729-900-89	s	DTC144ES
Q15	8-729-900-89	s	DTC144ES
Q16	8-729-900-89	s	DTC144ES
Q17	8-729-900-89	s	DTC144ES
Q18	8-729-900-89	s	DTC144ES
Q21	8-729-900-89	s	DTC144ES
S1	1-552-539-00	s	KEY "STOP"
S2	1-552-539-00	s	KEY "PLAY"
S4	1-553-739-21	s	KEY "MARK A"
S5	1-552-539-00	s	KEY "EJECT"
S6	1-552-539-00	s	KEY "PAUSE"
S8	1-553-739-21	s	KEY "MARK B"
S9	1-552-539-00	s	KEY "REW"
S10	1-552-539-00	s	KEY "SEARCH FWD"
S11	1-553-739-21	s	KEY "RESET"
S12	1-552-539-00	s	KEY "FF"
S13	1-552-539-00	s	KEY "SEARCH REV"
S17	1-516-963-00	s	SLIDE "AUDIO MONITOR"
S20	1-516-995-00	s	SLIDE "PROGRAMMED OPERATION"
X1	1-527-992-11	s	CERAMIC,6MHz

Ref.No.	Parts No.	SP	Description
LM-13 BOARD			
	1-618-600-11	o	PRINTED CIRCUIT BOARD,LM-13
PD-29 BOARD			
	⚠A-6725-536-A	o	MOUNTED CIRCUIT BOARD,PD-29
C1	1-124-927-11	s	ELECT 4.7 20% 100V
C2	1-124-927-11	s	ELECT 4.7 20% 100V
C3	1-124-927-11	s	ELECT 4.7 20% 100V
C4	1-124-927-11	s	ELECT 4.7 20% 100V
D1	8-719-200-02	s	10E-2
D2	8-719-200-02	s	10E-2
D3	8-719-200-02	s	10E-2
D4	8-719-200-02	s	10E-2
D5	8-719-200-02	s	10E-2
D6	8-719-200-02	s	10E-2
D7	8-719-200-02	s	10E-2
D8	8-719-200-02	s	10E-2
D10	8-719-200-02	s	10E-2
D11	8-719-200-02	s	10E-2
D12	8-719-200-02	s	10E-2
D13	8-719-200-02	s	10E-2
Q1	8-729-811-11	s	2SD1111
Q2	8-729-178-54	s	2SC2785
Q3	8-729-889-40	s	2SD894
Q4	8-729-811-11	s	2SD1111
Q5	8-729-178-54	s	2SC2785
Q6	8-729-889-40	s	2SD894
Q8	8-729-811-11	s	2SD1111
Q9	8-729-178-54	s	2SC2785
Q10	8-729-199-82	s	2SD998
Q11	8-729-811-11	s	2SD1111
Q12	8-729-178-54	s	2SC2785
Q13	8-729-178-54	s	2SC2785
Q14	8-729-199-82	s	2SD998
⚠ R6	1-249-382-11	s	CARBON 1.2 5% 1/6W
R12	1-249-382-11	s	CARBON 1.2 5% 1/6W
R19	1-249-382-11	s	CARBON 1.2 5% 1/6W
R25	1-249-382-11	s	CARBON 1.2 5% 1/6W
R30	1-249-382-11	s	CARBON 1.2 5% 1/6W

PD-30 BOARD

Ref.No.	Parts No.	SP	Description
⚠	A-6725-537-A	o	MOUNTED CIRCUIT BOARD,PD-30
C1	1-124-927-11	s	ELECT 4.7 20% 100V
C2	1-124-927-11	s	ELECT 4.7 20% 100V
D1	8-719-200-02	s	10E-2
D2	8-719-200-02	s	10E-2
D3	8-719-200-02	s	10E-2
D4	8-719-200-02	s	10E-2
D5	8-719-200-02	s	10E-2
D6	8-719-200-02	s	10E-2
Q1	8-729-811-11	s	2SD1111
Q2	8-729-178-54	s	2SC2785
Q3	8-729-889-40	s	2SD894
Q4	8-729-811-11	s	2SD1111
Q5	8-729-178-54	s	2SC2785
Q6	8-729-889-40	s	2SD894
⚠ R6	1-249-382-11	s	CARBON 1.2 5% 1/6W
R12	1-249-382-11	s	CARBON 1.2 5% 1/6W

PH-5 BOARD

Ref.No.	Parts No.	SP	Description
	1-603-737-11	o	PRINTED CIRCUIT BOARD,PH-5
D1	8-719-951-04	s	BR5104S
Q1	8-729-810-22	s	SPS102

PT-9 BOARD

Ref.No.	Parts No.	SP	Description
	1-605-018-11	o	PRINTED CIRCUIT BOARD,PT-9
Q1	8-729-377-13	s	2SA771-Y

PTC-16 BOARD

Ref.No.	Parts No.	SP	Description
	1-618-598-11	o	PRINTED CIRCUIT BOARD,PTC-16
IC1	8-719-104-42	s	PS4005-L

PTC-17 BOARD

Ref.No.	Parts No.	SP	Description
	1-618-872-11	o	PRINTED CIRCUIT BOARD,PTC-17
IC1	8-719-104-42	s	PS4005-L
IC2	8-719-104-42	s	PS4005-L

RM-39 BOARD

Ref.No.	Parts No.	SP	Description
	1-618-873-11	o	PRINTED CIRCUIT BOARD,RM-39
C1	1-101-006-00	s	CERAMIC 0.047 50V
C2	1-101-006-00	s	CERAMIC 0.047 50V
L1	1-410-623-11	s	4.7
L2	1-410-623-11	s	4.7

SE-46 BOARD

Ref.No.	Parts No.	SP	Description
	1-618-599-11	o	PRINTED CIRCUIT BOARD,SE-46
PC1	1-806-232-21	s	TENSION REG DET.MB-1102/S.N

SV-74 BOARD

Ref.No.	Parts No.	SP	Description
⚠	A-6715-323-A	o	MOUNTED CIRCUIT BOARD,SV-74
C3	1-124-903-00	s	ELECT 1 20% 50V
C4	1-124-896-00	s	ELECT 33 20% 16V
C6	1-162-304-31	s	CERAMIC 0.0047 20% 16V
C7	1-162-301-31	s	CERAMIC 0.0015 20% 16V
C9	1-124-904-00	s	ELECT 2.2 20% 50V
C10	1-131-350-00	s	TANTALUM 3.3 20% 35V
C12	1-162-305-31	s	CERAMIC 0.0068 20% 16V
C13	1-124-896-00	s	ELECT 33 20% 16V
C14	1-161-059-00	s	CERAMIC 0.047 10% 50V
C16	1-124-480-11	s	ELECT 470 20% 25V
C17	1-161-057-00	s	CERAMIC 0.033 10% 50V
C18	1-161-013-00	s	CERAMIC 0.01 10% 25V
C101	1-124-902-00	s	ELECT 0.47 20% 50V
C104	1-162-215-31	s	CERAMIC 47PF 5% 50V
C106	1-161-047-00	s	CERAMIC 0.0047 10% 50V
C107	1-123-332-00	s	ELECT 47 20% 16V
C108	1-124-907-00	s	ELECT 10 20% 50V
C109	1-124-483-00	s	ELECT 47 20% 35V
C110	1-124-483-00	s	ELECT 47 20% 35V
C111	1-161-042-00	s	CERAMIC 0.0018 10% 50V
C112	1-161-042-00	s	CERAMIC 0.0018 10% 50V
C116	1-162-286-31	s	CERAMIC 220PF 10% 50V
C203	1-162-211-31	s	CERAMIC 33PF 5% 50V
C204	1-162-211-31	s	CERAMIC 33PF 5% 50V
C301	1-161-013-00	s	CERAMIC 0.01 10% 25V

Ref.No.	Parts No.	SP	Description
C302	1-161-040-00	s	CERAMIC 0.0012 10% 50V
C304	1-124-481-11	s	ELECT 22 20% 35V
C305	1-124-481-11	s	ELECT 22 20% 35V
C306	1-162-286-31	s	CERAMIC 220PF 10% 50V
C307	1-162-288-31	s	CERAMIC 330PF 10% 50V
C308	1-162-306-31	s	CERAMIC 0.01 20% 16V
C309	1-162-306-31	s	CERAMIC 0.01 20% 16V
C312	1-124-903-00	s	ELECT 1 20% 50V
C402	1-124-902-00	s	ELECT 0.47 20% 50V
C404	1-124-902-00	s	ELECT 0.47 20% 50V
C406	1-124-902-00	s	ELECT 0.47 20% 50V
C408	1-124-443-00	s	ELECT 100 20% 10V
C409	1-162-306-31	s	CERAMIC 0.01 20% 16V
C415	1-124-896-00	s	ELECT 33 20% 16V
C418	1-162-282-31	s	CERAMIC 100PF 10% 50V
C422	1-123-608-00	s	ELECT 0.22 20% 50V
C423	1-162-289-31	s	CERAMIC 390PF 10% 50V
C424	1-124-907-00	s	ELECT 10 20% 50V
C425	1-124-904-00	s	ELECT 2.2 20% 50V
C426	1-124-904-00	s	ELECT 2.2 20% 50V
C429	1-124-471-00	s	ELECT 1000 20% 16V
C430	1-123-607-00	s	ELECT 0.1 20% 50V
C432	1-124-445-00	s	ELECT 100 20% 16V
C701	1-123-332-00	s	ELECT 47 20% 16V
C702	1-162-306-31	s	CERAMIC 0.01 20% 16V
C703	1-162-306-31	s	CERAMIC 0.01 20% 16V
C704	1-162-306-31	s	CERAMIC 0.01 20% 16V
C705	1-162-306-31	s	CERAMIC 0.01 20% 16V
C706	1-124-119-00	s	ELECT 330 20% 16V
C707	1-123-332-00	s	ELECT 47 20% 16V
C709	1-162-306-31	s	CERAMIC 0.01 20% 16V
C711	1-162-306-31	s	CERAMIC 0.01 20% 16V
C714	1-162-306-31	s	CERAMIC 0.01 20% 16V
C716	1-162-306-31	s	CERAMIC 0.01 20% 16V
C717	1-123-332-00	s	ELECT 47 20% 16V
C718	1-162-306-31	s	CERAMIC 0.01 20% 16V
C719	1-161-039-00	s	CERAMIC 0.001 10% 25V
D1	8-719-911-19	s	1SS119
D2	8-719-911-19	s	1SS119
D3	8-719-911-19	s	1SS119
D5	8-719-911-19	s	1SS119
D7	8-719-911-55	s	U05G
D101	8-719-911-19	s	1SS119
D103	8-719-911-19	s	1SS119
D104	8-719-911-19	s	1SS119
D105	8-719-911-19	s	1SS119
D106	8-719-911-19	s	1SS119
D107	8-719-911-19	s	1SS119
D108	8-719-911-19	s	1SS119
D109	8-719-911-19	s	1SS119
D110	8-719-911-19	s	1SS119
D111	8-719-911-19	s	1SS119

Ref. No.	Parts No.	SP	Description
D112	8-719-911-19	s	1SS119
D203	8-719-911-19	s	1SS119
D204	8-719-911-19	s	1SS119
D205	8-719-911-19	s	1SS119
D303	8-719-911-19	s	1SS119
D401	8-719-911-19	s	1SS119
D402	8-719-911-19	s	1SS119
D405	8-719-911-19	s	1SS119
D406	8-719-911-19	s	1SS119
D407	8-719-911-19	s	1SS119
D408	8-719-911-19	s	1SS119
D409	8-719-911-19	s	1SS119
D410	8-719-911-19	s	1SS119
D411	8-719-911-19	s	1SS119
IC1	8-759-132-40	s	uPC324C(NEC)
IC2	8-759-700-08	s	NJM4558S(JRC)
IC3	8-759-705-58	s	NJM4558D-D(JRC)
IC5	8-759-240-53	s	TC4053BP(TOSHIBA)
IC7	8-759-240-71	s	TC4071PB(TOSHIBA)
IC8	8-759-132-40	s	uPC324C(NEC)
IC9	8-759-132-40	s	uPC324C(NEC)
IC10	8-759-133-90	s	uPC339C(NEC)
IC11	8-759-240-30	s	TC4030BP(TOSHIBA)
IC12	8-759-145-58	s	uPC4558C(NEC)
IC13	8-759-240-53	s	TC4053BP(TOSHIBA)
IC14	8-759-340-13	s	HD14013BP(HITACHI)
IC15	8-759-200-01	s	TC4001UBP(TOSHIBA)
IC17	8-751-941-05	s	CX194B-5(SONY)
IC18	8-759-929-59	s	MB88505-441M(FUJITSU)
IC19	8-759-240-30	s	TC4030BP(TOSHIBA)
IC20	8-759-240-53	s	TC4053BP(TOSHIBA)
Q1	8-729-178-54	s	2SC2785
Q3	8-729-376-84	s	2SA768-G
Q4	8-729-178-54	s	2SC2785
Q5	8-729-113-32	s	2SB733
Q101	8-729-900-83	s	DTC124XS
Q102	8-729-178-54	s	2SC2785
Q103	8-729-900-83	s	DTC124XS
Q104	8-729-117-54	s	2SA1175
Q106	8-729-178-54	s	2SC2785
Q107	8-729-105-73	s	2SK523-L2
Q108	8-729-900-83	s	DTC124XS
Q109	8-729-900-83	s	DTC124XS
Q110	8-729-178-54	s	2SC2785
Q111	8-729-288-02	s	2SD880
Q112	8-729-113-32	s	2SB733
Q201	8-729-900-83	s	DTC124XS
Q202	8-729-900-83	s	DTC124XS
Q203	8-729-900-83	s	DTC124XS
Q204	8-729-900-83	s	DTC124XS
Q205	8-729-900-83	s	DTC124XS
Q206	8-729-900-83	s	DTC124XS
Q304	8-729-178-54	s	2SC2785
Q401	8-729-178-54	s	2SC2785
Q403	8-729-178-54	s	2SC2785
Q404	8-729-178-54	s	2SC2785
Q411	8-729-178-54	s	2SC2785
Q412	8-729-178-54	s	2SC2785

Ref.No.	Parts No.	SP	Description
⚠ R42	1-207-621-00	s	WIREWOUND 1.5 10% 3W
R102	1-215-443-00	s	METAL 8.2k 1% 1/6W
R103	1-215-453-00	s	METAL 22k 1% 1/6W
R145	1-215-461-00	s	METAL 47k 1% 1/6W
R146	1-215-461-00	s	METAL 47k 1% 1/6W
R164	1-215-391-00	s	METAL 56 1% 1/6W
R218	1-215-493-00	s	METAL 1M 1% 1/6W
R235	1-215-449-00	s	METAL 15k 1% 1/6W
R236	1-215-456-00	s	METAL 30k 1% 1/6W
R237	1-215-464-00	s	METAL 62k 1% 1/6W
R238	1-215-471-00	s	METAL 120k 1% 1/6W
R239	1-215-478-00	s	METAL 240k 1% 1/6W
R240	1-215-486-00	s	METAL 510k 1% 1/6W
R241	1-215-493-00	s	METAL 1M 1% 1/6W
R242	1-215-493-00	s	METAL 1M 1% 1/6W
⚠ R461	1-207-636-00	s	WIREWOUND 100 10% 3W
RV1	1-228-994-00	s	VAR,METAL GLAZE 10k
RV3	1-228-990-00	s	VAR,METAL GLAZE 1k
RV100	1-228-993-00	s	VAR,METAL GLAZE 4.7k
RV101	1-228-994-00	s	VAR,METAL GLAZE 10k
RV102	1-228-994-00	s	VAR,METAL GLAZE 10k
RV106	1-228-993-00	s	VAR,METAL GLAZE 4.7k
RV107	1-228-995-00	s	VAR,METAL GLAZE 22k
RV201	1-228-990-00	s	VAR,METAL GLAZE 1k
RV401	1-228-996-00	s	VAR,METAL GLAZE 47k
RV403	1-228-996-00	s	VAR,METAL GLAZE 47k
RV405	1-228-996-00	s	VAR,METAL GLAZE 47k
RV407	1-228-997-00	s	VAR,METAL GLAZE 100k
X2	1-527-734-00	s	CRYSTAL,6MHz

SW-50 BOARD

Ref.No.	Parts No.	SP	Description
	1-603-435-00	o	PRINTED CIRCUIT BOARD,SW-50
IC1	8-719-104-42	s	PS4005-L

SY-51 BOARD

Ref.No.	Parts No.	SP	Description
	⚠ A-6717-433-A		MOUNTED CIRCUIT BOARD,SY-51
C1	1-125-393-11	s	0.47F 30% 5.5V
C2	1-161-059-00	s	CERAMIC 0.047 10% 50V
C3	1-161-013-00	s	CERAMIC 0.01 10% 25V
C4	1-161-041-00	s	CERAMIC 0.0015 10% 50V
C5	1-161-013-00	s	CERAMIC 0.01 10% 25V
C6	1-161-055-00	s	CERAMIC 0.022 10% 50V
C7	1-124-481-11	s	ELECT 22 20% 25V
C8	1-124-481-11	s	ELECT 22 20% 25V
C9	1-124-445-00	s	ELECT 100 20% 16V
C10	1-162-286-31	s	CERAMIC 220PF 10% 50V
C11	1-124-903-00	s	ELECT 1 20% 50V
C12	1-123-332-00	s	ELECT 47 20% 25V
C13	1-124-445-00	s	ELECT 100 20% 16V
C14	1-162-286-31	s	CERAMIC 220PF 10% 50V
C15	1-161-058-00	s	CERAMIC 0.039 10% 50V
C17	1-124-903-00	s	ELECT 1 20% 50V
C18	1-131-358-00	s	TANTALUM 6.8 20% 25V
C19	1-161-013-00	s	CERAMIC 0.01 10% 25V
C20	1-161-057-00	s	CERAMIC 0.033 10% 50V
C21	1-161-013-00	s	CERAMIC 0.01 10% 25V
C22	1-162-216-00	s	CERAMIC 51PF 5% 50V
C23	1-124-903-00	s	ELECT 1 20% 50V
C24	1-124-907-00	s	ELECT 10 20% 50V
C25	1-124-892-11	s	ELECT 47 20% 10V
C26	1-161-059-00	s	CRAMIC 0.047 10% 50V
C27	1-123-332-00	s	ELECT 47 20% 25V
C28	1-124-892-11	s	ELECT 47 20% 10V
C29	1-124-445-00	s	ELECT 100 20% 16V
C30	1-124-903-00	s	ELECT 1 20% 50V
C31	1-161-039-00	s	CERAMIC 0.001 10% 50V
C32	1-162-221-31	s	CERAMIC 33PF 5% 50V
C33	1-161-059-00	s	CERAMIC 0.047 10% 50V
C34	1-161-039-00	s	CERAMIC 0.001 10% 50V
C35	1-124-892-11	s	ELECT 47 20% 10V
C36	1-161-059-00	s	CERAMIC 0.047 10% 50V
C37	1-162-211-31	s	CERAMIC 33PF 5% 50V
C38	1-161-055-00	s	CERAMIC 0.022 10% 50V
C40	1-124-445-00	s	ELECT 100 20% 16V
C41	1-124-892-11	s	ELECT 47 20% 10V
C42	1-161-059-00	s	CERAMIC 0.047 10% 50V
C43	1-124-445-00	s	ELECT 100 20% 16V
C44	1-124-445-00	s	ELECT 100 20% 16V
C45	1-124-444-00	s	ELECT 220 20% 10V
C46	1-162-290-31	s	CERAMIC 10% 50V
C47	1-162-211-31	s	CERAMIC 33PF 5% 50V
C48	1-162-211-31	s	CERAMIC 33PF 5% 50V
C49	1-124-903-00	s	ELECT 1 20% 50V
C50	1-124-903-00	s	ELECT 1 20% 50V
C51	1-124-892-11	s	ELECT 47 20% 10V
C53	1-124-905-00	s	ELECT 3.3 20% 50V
C54	1-124-902-00	s	ELECT 0.47 20% 50V
D1	8-719-911-19	s	1SS119
D2	8-719-911-19	s	1SS119
D3	8-719-911-19	s	1SS119
D4	8-719-911-19	s	1SS119
D5	8-719-911-19	s	1SS119
D6	8-719-911-19	s	1SS119
D7	8-719-911-19	s	1SS119
D8	8-719-911-19	s	1SS119
D9	8-719-911-19	s	1SS119
D10	8-719-911-19	s	1SS119
D11	8-719-911-19	s	1SS119
D12	8-719-911-19	s	1SS119
D13	8-719-911-19	s	1SS119
D14	8-719-911-19	s	1SS119
D15	8-719-911-19	s	1SS119
D16	8-719-911-19	s	1SS119
D17	8-719-911-19	s	1SS119
D18	8-719-911-19	s	1SS119
D20	8-719-911-19	s	1SS119
D21	8-719-911-55	s	U05G

Ref.No.	Parts No.	SP	Description
D22	8-719-911-55	s	U05G
D23	8-719-911-55	s	U05G
D24	8-719-911-19	s	1SS119
D25	8-719-911-19	s	1SS119
D26	8-719-911-19	s	1SS119
D27	8-719-911-19	s	1SS119
D28	8-719-911-19	s	1SS119
IC1	8-759-145-58	s	uPC4558C(NEC)
IC2	8-759-145-58	s	uPC4558C(NEC)
IC3	8-759-345-38	s	HD14538BP(HITACHI)
IC4	8-759-135-80	s	uPC358C(NEC)
IC5	8-759-145-58	s	uPC4558C(NEC)
IC7	8-759-929-61	s	MB88521-144M(FUJITSU)
IC8	8-759-729-03	s	NJM2903D(JRC)
IC9	8-759-600-24	s	M54543L(MITSUBISHI)
IC10	8-759-600-24	s	M54543L(MITSUBISHI)
IC11	8-759-240-69	s	TC4069UBP(TOSHIBA)
IC12	8-759-929-60	s	MB88505-442M(FUJITSU)
IC13	8-759-220-00	s	TC40H000P(TOSHIBA)
IC14	8-759-913-99	s	MB88201-173N(FUJITSU)
IC15	8-759-729-03	s	NJM2903D(JRC)
IC18	8-759-240-69	s	TC4069UBP(TOSHIBA)
IC19	8-759-345-38	s	HD14538BP(HITACHI)
Q1	8-729-177-43	s	2SD774
Q3	8-729-889-40	s	2SD894
Q4	8-729-178-55	s	2SC2785-E
Q5	8-729-178-55	s	2SC2785-E
Q6	8-729-178-55	s	2SC2785-E
Q7	8-729-178-55	s	2SC2785-E
Q8	8-729-178-55	s	2SC2785-E
Q9	8-729-900-89	s	DTC144ES
Q10	8-729-117-54	s	2SA1175
Q11	8-729-900-89	s	DTC144ES
Q12	8-729-117-54	s	2SA1175
Q13	8-729-900-89	s	DTC144ES
Q14	8-729-900-89	s	DTC144ES
Q15	8-729-178-55	s	2SC2785-E
Q16	8-729-178-55	s	2SC2785-E
Q17	8-729-900-89	s	DTC144ES
Q18	8-729-900-89	s	DTC144ES
Q19	8-729-900-89	s	DTC144ES
Q20	8-729-178-55	s	2SC2785-E
Q23	8-729-900-89	s	DTC144ES
Q24	8-729-900-89	s	DTC144ES
Q26	8-729-900-89	s	DTC144ES
Q27	8-729-178-55	s	2SC2785-E
Q28	8-729-117-54	s	2SA1175
Q29	8-729-178-55	s	2SC2785-E
Q31	8-729-178-55	s	2SC2785-E
Q35	8-729-382-64	s	2SC1826-G
Q36	8-729-900-89	s	DTC144ES
Q37	8-729-900-89	s	DTC144ES
Q38	8-729-900-89	s	DTC144ES

Ref.No.	Parts No.	SP	Description
⚠R11	1-207-674-00	s	WIREWOUND 4.7 10% 6W
R17	1-249-393-11	s	CARBON 10 5% 1/6W
R78	1-249-393-11	s	CARBON 10 5% 1/6W
R112	1-247-700-11	s	CARBON 100 5% 1/4W
R159	1-214-853-00	s	METAL 360 1% 1/2W
R160	1-214-852-00	s	METAL 330 1% 1/2W
R184	1-247-210-00	s	CARBON 56 5% 1/2W
R192	1-532-637-00	s	LINK,IC
R200	1-532-675-00	s	LINK,IC
RV1	1-230-722-11	s	VAR,CARBON 22k
RV2	1-230-720-11	s	VAR,CARBON 4.7k
RV3	1-230-720-11	s	VAR,CARBON 4.7k
RV4	1-230-722-11	s	VAR,CARBON 22k
SW1	1-552-509-00	s	DIP "MODE SELECT"
X1	1-567-143-00	s	CERAMIC,6MHz
X2	1-527-822-00	s	CERAMIC,4MHz

TG-22 BOARD

Ref.No.	Parts No.	SP	Description
	1-618-597-11	o	PRINTED CIRCUIT BOARD,TG-22
IC1	8-719-104-42	s	PS4005-L

UR-14 BOARD

Ref.No.	Parts No.	SP	Description
	⚠1-413-248-11	s	SWITCHING REGULATOR
⚠C101	1-161-742-00	s	CERAMIC 2200PF 20% 400V
C102	1-161-742-00	s	CERAMIC 2200PF 20% 400V
C103	1-161-742-00	s	CERAMIC 2200PF 20% 400V
C104	1-161-742-00	s	CERAMIC 2200PF 20% 400V
C105	1-136-212-00	s	MYLAR 0.1 20% 250V
⚠C106	1-136-212-00	s	MYLAR 0.1 250V
C107	1-161-742-00	s	CERAMIC 2200PF 20% 400V
C108	1-161-742-00	s	CERAMIC 2200PF 20% 400V
C109	1-124-961-00	s	ELECT 220 20% 200V
C110	1-124-023-00	s	ELECT 4.7 20% 350V
C111	1-124-023-00	s	ELECT 4.7 350V
C112	1-124-549-00	s	ELECT 100 10V
C113	1-124-961-00	s	ELECT 220 20% 200V
C114	1-124-549-00	s	ELECT 100 10V
C201	1-108-413-00	s	MYLAR 2200PF 200V

Ref.No.	Parts No.	SP	Description
C202	1-108-413-00	s	MYLAR 2200PF 10% 200V
C203	1-161-825-11	s	CERAMIC 220PF 10% 500V
C204	1-161-825-11	s	CERAMIC 220PF 10% 500V
C205	1-161-825-11	s	CERAMIC 220PF 10% 500V
C206	1-161-825-11	s	CERAMIC 220PF 10% 500V
C207	1-123-357-00	s	ELECT 22 20% 50V
C209	1-108-413-00	s	MYLAR 2200PF 200V
C210	1-136-153-00	s	MYLAR 0.01 5% 50V
C211	1-130-516-00	s	MYLAR 0.01 5% 50V
C212	1-124-556-00	s	ELECT 2200 20% 16V
C213	1-124-556-00	s	ELECT 2200 16V
C214	1-124-556-00	s	ELECT 2200 16V
C215	1-124-556-00	s	ELECT 2200 16V
C216	1-123-326-00	s	ELECT 3300 20% 16V
C217	1-123-332-00	s	ELECT 47 20% 50V
C651	1-124-445-00	s	ELECT 100 20% 16V
C652	1-130-591-11	s	MYLAR 3300PF 2% 100V
C653	1-136-141-00	s	MYLAR 1000PF 10% 50V
C654	1-136-165-00	s	MYLAR 0.1 5% 50V
C655	1-123-318-00	s	ELECT 33 16V
⚠ CN101	1-560-436-00	o	RECEPTACLE, 3P
	1-561-218-11	o	HOUSING, 3P
	1-561-254-11	o	CONTACT
CN201	1-560-438-00	o	RECEPTACLE, 5P
	1-561-424-11	o	HOUSING, 5P
	1-561-254-11	o	CONTACT
D101	8-719-300-00	s	LB-156
D201	8-719-908-00	s	ESAC33-02CS
D202	8-719-908-00	s	ESAC33-02CS
D203	8-719-900-93	s	V09C
D204	8-719-900-93	s	V09C
D205	8-719-815-55	s	1S1555
D206	8-719-100-61	s	RD11EB2
D208	8-719-101-67	s	RD7.5EL2
D209	8-719-100-30	s	RD5.1EB2
D210	8-719-100-30	s	RD5.1EB2
D651	8-719-200-02	s	10E-2
D652	8-719-100-70	s	RD15EB1
D653	8-719-815-55	s	1S1555
FB101	1-543-060-00	s	
FB102	1-543-060-00	s	
FB201	1-543-060-00	s	
FB202	1-543-060-00	s	
FB203	1-543-060-00	s	
FB204	1-543-060-00	s	
FB205	1-543-060-00	s	
FB206	1-543-060-00	s	
FB207	1-543-060-00	s	
FB208	1-543-060-00	s	
FB209	1-543-060-00	s	
IC651	8-759-937-00	s	MB3759(FUJITSU)

Ref.No.	Parts No.	SP	Description
⚠ L101	1-421-848-11	s	LINE FILTER
L201	1-421-849-11	s	CHOKE, 2.4mH
L203	1-408-316-00	s	CHOKE
L204	1-421-850-11	s	CHOKE,12
L205	1-421-329-00	s	CHOKE
Q101	8-729-901-72	s	2SC3317
Q102	8-729-901-72	s	2SC3317
Q103	8-729-100-13	s	2SC2001
Q104	8-729-100-13	s	2SC2001
Q201	8-729-600-27	s	2SC2603-F
Q202	8-729-117-54	s	2SA1175-F
R101	1-214-947-00	s	METAL 2.7M 1% 1/2W
⚠ R102	1-205-715-11	s	CEMENT 3.3 5% 5W
R103	1-246-529-00	s	CARBON 220k 5% 1/4W
R104	1-246-529-00	s	CARBON 220k 5% 1/4W
⚠ R105	1-212-934-00	s	METAL 1 5% 1/2W
R106	1-247-107-00	s	NF CARBON 100 5% 1/4W
R107	1-246-529-00	s	CARBON 220k 5% 1/4W
R108	1-246-529-00	s	CARBON 220k 5% 1/4W
⚠ R109	1-212-934-00	s	METAL 1 5% 1/2W
R110	1-247-107-00	s	NF CARBON 100 5% 1/4W
⚠ R111	1-205-715-00	s	CEMENT 3.3 5% 5W
R201	1-206-475-00	s	METAL 33 5% 2W
R202	1-535-369-00	s	SHUNT
R203	1-213-151-00	s	METAL 4.7k 5% 5W
R204	1-247-131-00	s	NF CARBON 1k 5% 1/4W
R205	1-247-143-00	s	NF CARBON 3.3k 5% 1/4W
R206	1-249-455-11	s	NF CARBON 4.7k 5% 1/4W
R207	1-247-139-00	s	NF CARBON 2.2k 5% 1/4W
R208	1-247-123-00	s	NF CARBON 470 5% 1/4W
R209	1-247-115-00	s	NF CARBON 220 5% 1/4W
R212	1-247-224-00	s	NF CARBON 220 5% 1/2W
R651	1-249-425-11	s	NF CARBON 4.7k 5% 1/6W
RV651	1-228-644-00	s	VAR, METAL 1k 0.3W
⚠ T101	1-448-423-11	s	CONVERTER
T102	1-437-120-00	s	DRIVE

VA-35 BOARD

Ref.No.	Parts No.	SP	Description
	A-6711-754-A	o	MOUNTED CIRCUIT BOARD,VA-35
C1	1-161-059-00	s	CERAMIC 0.047 10% 50V
C2	1-124-903-00	s	ELECT 1 20% 50V
C3	1-161-059-00	s	CERAMIC 0.047 10% 50V
C4	1-124-903-00	s	ELECT 1 20% 50V
C5	1-161-059-00	s	CERAMIC 0.047 10% 50V
C6	1-123-332-00	s	ELECT 47 20% 25V
C7	1-162-209-31	s	CERAMIC 27PF 5% 50V
C8	1-162-209-31	s	CERAMIC 27PF 5% 50V
C9	1-162-306-31	s	CERAMIC 0.01 30% 16V
C10	1-124-892-11	s	ELECT 47 20% 10V
C11	1-161-059-00	s	CERAMIC 0.047 10% 50V
C12	1-123-332-00	s	ELECT 47 20% 25V
C13	1-161-059-00	s	CERAMIC 0.047 10% 50V
C14	1-161-059-00	s	CERAMIC 0.047 10% 50V
C15	1-162-306-31	s	CERAMIC 0.01 30% 16V
C16	1-123-332-00	s	ELECT 47 20% 25V
C17	1-162-306-31	s	CERAMIC 0.01 30% 16V
C18	1-162-306-31	s	CERAMIC 0.01 30% 16V
C19	1-162-306-31	s	CERAMIC 0.01 30% 16V
C20	1-123-332-00	s	ELECT 47 20% 25V
C21	1-162-288-31	s	CERAMIC 330PF 10% 50V
C22	1-162-282-31	s	CERAMIC 100PF 10% 50V
C23	1-162-306-31	s	CERAMIC 0.01 30% 16V
C24	1-161-059-00	s	CERAMIC 0.047 10% 50V
C25	1-162-306-31	s	CERAMIC 0.01 30% 16V
C28	1-161-059-00	s	CERAMIC 0.047 10% 50V
C29	1-161-055-00	s	CERAMIC 0.022 10% 50V
C30	1-161-059-00	s	CERAMIC 0.047 10% 50V
C31	1-162-306-31	s	CERAMIC 0.01 30% 16V
C32	1-124-892-11	s	ELECT 47 20% 10V
C33	1-161-059-00	s	CERAMIC 0.047 10% 50V
C34	1-162-306-31	s	CERAMIC 0.01 30% 16V
C35	1-162-306-31	s	CERAMIC 0.01 30% 16V
C36	1-123-332-00	s	ELECT 47 20% 25V
C101	1-162-306-31	s	CERAMIC 0.01 30% 16V
C102	1-162-283-31	s	CERAMIC 120PF 10% 50V.
C104	1-124-443-00	s	ELECT 100 20% 10V
C108	1-162-283-31	s	CERAMIC 120PF 10% 50V
C109	1-124-444-00	s	ELECT 220 20% 10V
C110	1-123-332-00	s	ELECT 47 20% 25V
C111	1-161-059-00	s	CERAMIC 0.047 10% 50V
C112	1-124-470-11	s	ELECT 470 20% 6.3V
C113	1-162-284-31	s	CERAMIC 150PF 10% 50V
C114	1-162-306-31	s	CERAMIC 0.01 30% 16V
C115	1-161-059-00	s	CERAMIC 0.047 10% 50V
C116	1-124-443-00	s	ELECT 100 20% 10V
C117	1-124-443-00	s	ELECT 100 20% 10V
C118	1-162-209-31	s	CERAMIC 27PF 5% 50V
C119	1-124-907-00	s	ELECT 10 20% 50V
C120	1-124-892-11	s	ELECT 47 20% 10V
C121	1-124-892-11	s	ELECT 47 20% 10V
C123	1-161-055-00	s	CERAMIC 0.022 10% 50V
C124	1-162-215-31	s	CERAMIC 47PF 5% 50V
C125	1-124-892-11	s	ELECT 47 20% 10V
C126	1-124-907-00	s	ELECT 10 20% 50V
C127	1-124-907-00	s	ELECT 10 20% 50V
C128	1-162-306-31	s	CERAMIC 0.01 30% 16V
C129	1-161-059-00	s	CERAMIC 0.047 10% 50V
C130	1-123-332-00	s	ELECT 47 20% 25V
C131	1-161-059-00	s	CERAMIC 0.047 10% 50V
C132	1-123-332-00	s	ELECT 47 20% 25V
C133	1-161-059-00	s	CERAMIC 0.047 10% 50V
C134	1-123-332-00	s	ELECT 47 20% 25V
C135	1-124-896-00	s	ELECT 33 20% 16V
C136	1-124-473-11	s	ELECT 1000 20% 10V
C137	1-124-473-11	s	ELECT 1000 20% 10V
C138	1-123-332-00	s	ELECT 47 20% 25V
C139	1-162-205-31	s	CERAMIC 18PF 5% 50V
C202	1-162-306-31	s	CERAMIC 0.01 30% 16V
C204	1-161-059-00	s	CERANMIC 0.047 10% 50V
C205	1-123-332-00	s	ELECT 47 20% 25V
C206	1-161-059-00	s	CERAMIC 0.047 10% 50V
C207	1-123-332-00	s	ELECT 47 20% 25V
C208	1-162-306-31	s	CERAMIC 0.01 30% 16V
C209	1-162-306-31	s	CERAMIC 0.01 30% 16V
C210	1-161-059-00	s	CERAMIC 0.047 10% 50V
C211	1-123-332-00	s	ELECT 47 20% 25V
C212	1-124-481-11	s	ELECT 22 20% 35V
C213	1-124-443-00	s	ELECT 100 20% 10V
C214	1-124-443-00	s	ELECT 100 20% 10V
C216	1-124-907-00	s	ELECT 10 20% 50V
C217	1-124-907-00	s	ELECT 10 20% 50V
C218	1-162-282-31	s	ERAMIC 100PF 10% 50V
C219	1-131-344-00	s	ELECT(SOLID) 0.33 10% 35V
C222	1-124-443-00	s	ELECT 100 20% 10V
C223	1-162-294-31	s	CERAMIC 0.001 10% 50V
C224	1-131-344-00	s	ELECT(SOLID) 0.33 10% 35V
C225	1-124-907-00	s	ELECT 10 20% 50V
C226	1-161-059-00	s	CERAMIC 0.047 10% 50V
C227	1-123-332-00	s	ELECT 47 20% 25V
C228	1-162-281-31	s	CERAMIC 91PF 10% 50V
C233	1-162-306-31	s	CERAMIC 0.01 30% 16V
C234	1-162-282-31	s	CERAMIC 100 10% 50V
C235	1-161-059-00	s	CERAMIC 0.047 10% 50V
C236	1-123-332-00	s	ELECT 47 20% 25V
C237	1-161-059-00	s	CERAMIC 0.047 10% 50V
C238	1-123-332-00	s	ELECT 47 20% 25V
C239	1-162-306-31	s	CERAMIC 0.01 30% 16V
C240	1-124-907-00	s	ELECT 10 20% 50V
C241	1-162-289-31	s	CERAMIC 390PF 10% 50V
C242	1-162-290-31	s	CERAMIC 470PF 10% 50V
C243	1-162-289-31	s	CERAMIC 390PF 10% 50V
C245	1-162-306-31	s	CERAMIC 0.01 30% 16V
C249	1-131-404-00	s	ELECT(SOLID) 0.22 20% 35V
C250	1-161-059-00	s	CERAMIC 0.047 10% 50V
C251	1-123-332-00	s	ELECT 47 20% 25V
C256	1-161-059-00	s	CERAMIC 0.047 10% 50V
C259	1-131-361-00	s	TANTALUM 2.2 20% 20V
C260	1-124-481-11	s	ELECT 22 20% 25V
C261	1-124-905-00	s	ELECT 3.3 20% 50V
C262	1-124-481-11	s	ELECT 22 20% 35V
C263	1-161-059-00	s	CERAMIC 0.047 10% 50V
C264	1-124-905-00	s	ELECT 3.3 20% 50V
C265	1-161-059-00	s	CERAMIC 0.047 10% 50V
C266	1-162-205-31	s	CERAMIC 18PF 5% 50V
C267	1-161-059-00	s	CERAMIC 0.047 10% 50V
C270	1-124-907-00	s	ELECT 10 20% 50V
C302	1-124-445-00	s	ELECT 100 20% 16V
C303	1-162-306-31	s	CERAMIC 0.01 30% 16V
C304	1-162-306-31	s	CERAMIC 0.01 30% 16V

Ref.No.	Parts No.	SP	Description
C305	1-161-059-00	s	CERAMIC 0.047 10% 50V
C306	1-123-332-00	s	ELECT 47 20% 25V
C308	1-161-059-00	s	CERAMIC 0.047 10% 50V
C309	1-123-332-00	s	ELECT 47 20% 25V
C310	1-162-306-31	s	CERAMIC 0.01 30% 16V
C311	1-162-203-31	s	CERAMIC 15PF 5% 50V
C312	1-162-280-31	s	CERAMIC 82PF 10% 50V
C318	1-162-306-31	s	CERAMIC 0.01 30% 16V
C319	1-124-892-11	s	ELECT 47 20% 10V
C320	1-162-306-31	s	CERAMIC 0.01 30% 16V
C321	1-124-445-00	s	ELECT 100 20% 16V
C322	1-124-904-00	s	ELECT 2.2 20% 50V
C901	1-162-290-31	s	CERAMIC 470PF 10% 50V
C902	1-162-290-31	s	CERAMIC 470PF 10% 50V
C903	1-124-907-00	s	ELECT 10 20% 50V
C904	1-124-907-00	s	ELECT 10 20% 50V
C905	1-124-468-11	s	ELECT 100 20% 6.3V
C906	1-124-468-11	s	ELECT 100 20% 6.3V
C907	1-162-282-31	s	CERAMIC 100PF 10% 50V
C908	1-162-282-31	s	CERAMIC 100PF 10% 50V
C911	1-124-907-00	s	ELECT 10 20% 50V
C912	1-124-907-00	s	ELECT 10 20% 50V
C913	1-124-907-00	s	ELECT 10 20% 50V
C914	1-124-907-00	s	ELECT 10 20% 50V
C915	1-124-468-11	s	ELECT 100 20% 6.3V
C916	1-124-468-11	s	ELECT 100 20% 6.3V
C917	1-124-907-00	s	ELECT 10 20% 50V
C918	1-124-907-00	s	ELECT 10 20% 50V
C919	1-162-282-31	s	CERAMIC 100PF 10% 50V
C920	1-162-282-31	s	CERAMIC 100PF 10% 50V
C921	1-162-306-31	s	CERAMIC 0.01 30% 16V
C922	1-162-306-31	s	CERAMIC 0.01 30% 16V
C951	1-123-332-00	s	ELECT 47 20% 25V
C952	1-124-445-00	s	ELECT 100 20% 16V
C953	1-123-321-00	s	ELECT 220 20% 16V
C954	1-123-332-00	s	ELECT 47 20% 25V
C955	1-124-907-00	s	ELECT 10 20% 50V
C956	1-123-332-00	s	ELECT 47 20% 25V
CV1	1-141-246-00	s	TRIMMER
D1	8-719-911-19	s	1SS119
D101	8-719-911-19	s	1SS119
D102	8-719-911-19	s	1SS119
D103	8-719-911-19	s	1SS119
D203	8-719-911-19	s	1SS119
D207	8-719-911-19	s	1SS119
D302	8-719-911-19	s	1SS119
D303	8-719-911-19	s	1SS119
D951	8-719-911-19	s	1SS119
D952	8-719-200-02	s	10E-2
DL1	1-415-242-00	s	COIL
DL2	1-415-372-11	s	1H (NTSC)
FL1	1-235-807-11	s	HIGH PASS
FL2	1-235-808-11	s	LOW PASS
FL3	1-235-809-11	s	LOW PASS
FL4	1-235-810-11	s	BAND PASS

Ref.No.	Parts No.	SP	Description
IC1	8-759-601-34	s	CX134(SONY)
IC2	8-751-350-00	s	CX135(SONY)
IC3	8-751-880-00	s	CX188(SONY)
IC4	8-759-908-59	s	CX859(SONY)
IC5	8-759-001-16	S	MC10116L(MOTOROLA)
IC6	8-759-200-60	s	TA7060AP(TOSHIBA)
IC7	8-759-240-01	s	TC4001BP(TOSHIBA)
IC901	8-759-800-66	s	LA3161(TOSHIBA)
IC902	8-759-800-36	s	LA3160(TOSHIBA)
L202	1-408-615-11	s	100
L211	1-410-067-11	s	4.7mH
L212	1-410-067-11	s	4.7mH
LV2	1-426-189-11	s	BPT
LV3	1-426-191-11	s	BPT
Q1	8-729-800-43	s	2SK152-3
Q2	8-729-800-43	s	2SK152-3
Q3	8-729-600-27	s	2SC2603-F
Q4	8-729-600-24	s	2SC403SP
Q5	8-729-600-24	s	2SC403SP
Q7	8-729-178-55	s	2SC2785-E
Q8	8-729-178-55	s	2SC2785-E
Q9	8-729-178-55	s	2SC2785-E
Q10	8-729-117-54	s	2SA1175
Q11	8-729-600-27	s	2SC2603-F
Q12	8-729-201-04	s	2SC2878-B
Q101	8-729-600-24	s	2SC403SP
Q102	8-729-117-54	s	2SA1175
Q103	8-729-600-24	s	2SC403SP
Q104	8-729-600-24	s	2SC403SP
Q105	8-729-600-24	s	2SC403SP
Q106	8-729-600-24	s	2SC403SP
Q107	8-729-600-24	s	2SC403SP
Q108	8-729-600-24	s	2SC403SP
Q109	8-729-600-24	s	2SC403SP
Q110	8-729-600-24	s	2SC403SP
Q111	8-729-600-24	s	2SC403SP
Q112	8-729-117-54	s	2SA1175
Q113	8-729-178-55	s	2SC2785-E
Q114	8-729-600-24	s	2SC403SP
Q115	8-729-600-24	s	2SC403SP
Q116	8-729-600-24	s	2SC403SP
Q117	8-729-600-24	s	2SC403SP
Q201	8-729-600-24	s	2SC403SP
Q202	8-729-600-24	s	2SC403SP
Q203	8-729-600-24	s	2SC403SP
Q204	8-729-201-04	s	2SC2878-B
Q205	8-729-600-24	s	2SC403SP
Q207	8-729-178-55	s	2SC2785-E
Q208	8-729-178-55	s	2SC2785-E
Q209	8-729-600-24	s	2SC403SP
Q211	8-729-117-54	s	2SA1175
Q212	8-729-178-55	s	2SC2785-E
Q213	8-729-178-55	s	2SC2785-E
Q303	8-729-600-27	s	2SC2603-F
Q304	8-729-178-55	s	2SC2785-E
Q306	8-729-600-24	s	2SC403SP
Q307	8-729-201-04	s	2SC2878-B
Q901	8-729-178-55	s	2SC2785-E
Q902	8-729-178-55	s	2SC2785-E

Ref.No.	Parts No.	SP	Description
Q903	8-729-178-55	s	2SC2785-E
Q904	8-729-178-55	s	2SC2785-E
Q951	8-729-117-54	s	2SA1175
Q952	8-729-178-55	s	2SC2785-E
R55	1-215-446-00	s	METAL 11k 1% 1/6W
R104	1-215-423-00	s	METAL 1.2k 1% 1/6W
R105	1-215-412-00	s	METAL 430 1% 1/6W
R110	1-215-416-00	s	METAL 620 1% 1/6W
R116	1-215-418-00	s	METAL 750 1% 1/6W
R119	1-215-420-00	s	METAL 910 1% 1/6W
R163	1-215-394-00	s	METAL 75 1% 1/6W
R164	1-215-394-00	s	METAL 75 1% 1/6W
R207	1-215-422-00	s	METAL 1.1k 1% 1/6W
R271	1-215-456-00	s	METAL 30k 1% 1/6W
R303	1-215-429-00	s	METAL 2.2k 1% 1/6W
R304	1-215-444-00	s	METAL 9.1k 1% 1/6W
RV1	1-228-990-00	s	VAR, METAL GLAZE 1k
RV2	1-228-990-00	s	VAR, METAL GLAZE 1k
RV3	1-228-991-00	s	VAR, METAL GLAZE 2.2k
RV4	1-228-991-00	s	VAR, METAL GLAZE 2.2k
RV5	1-228-993-00	s	VAR, METAL GLAZE 4.7k
RV6	1-228-991-00	s	VAR, METAL GLAZE 2.2k
RV7	1-228-990-00	s	VAR, METAL GLAZE 1k
RV8	1-228-993-00	s	VAR, METAL GLAZE 4.7k
RV9	1-228-993-00	s	VAR, METAL GLAZE 4.7k
RV10	1-228-993-00	s	VAR, METAL GLAZE 4.7k
RV11	1-228-991-00	s	VAR, METAL GLAZE 2.2k
RV12	1-228-990-00	s	VAR, METAL GLAZE 1k
RV13	1-228-996-00	s	VAR, METAL GLAZE 47k
RV901	1-228-991-00	s	VAR, METAL GLAZE 2.2k
RV902	1-228-991-00	s	VAR, METAL GLAZE 2.2k
RV903	1-228-994-00	s	VAR, METAL GLAZE 10k
RV904	1-228-994-00	s	VAR, METAL GLAZE 10k
T1	1-426-018-00	s	AF
T2	1-426-018-00	s	AF
X1	1-527-376-00	s	CRYSTAL, 3.579545MHz

Ref.No.	Parts No.	SP	Description
FRAME			
⚠	1-413-248-11	s	SWITCHING REGULATOR
⚠CN1001	1-534-517-41	s	CORD, AC(UC)
CN1001	1-551-188-XX	s	CORD, AC(J)
CN1002	1-563-356-11	s	8P MULTI "TV"
CN1003	1-563-354-11	s	BNC "VIDEO OUT"
CN1004	1-563-353-11	s	PIN JACK "AUDIO CH-1 OUT"
CN1005	1-563-353-11	s	PIN JACK "AUDIO CH-2 OUT"
CN1006	1-563-353-11	s	PIN JACK "AUDIO MONITOR OUT"
CN1007	1-563-355-11	s	"REMOTE"
⚠CN1008	1-526-774-11	s	"AC OUT" (J)
CN1011	1-507-312-00	s	"RF MOD"
CN1012	1-507-410-00	s	"RF OUT"
CS1001	1-586-633-00	s	CONDENSATION SENSOR
H1001	A-6709-560-A	s	DUR-37-R UPPER DRUM ASSY
H1002	8-829-358-41	s	PP150-5803B "AUDIO PB/CTL PB"
H1003	8-825-514-20	s	PP170-58 FR CTL
M1001	8-835-177-01	s	BHF-1915A "CAPSTAN"
M1002	A-6709-558-A	s	DUH-37A-R DRUM ASSY
M1003	8-835-055-01	s	DC DNR-4700A "THREADING"
M1005	8-735-179-01	s	DC MCB2B15 "CASSETTE COMPARTMENT"
M1006	8-735-178-01	s	DC FN30-T26N1E "REEL"
PL1001	1-518-508-00	s	CASSETTE COMPARTMENT 12V, 55mA
PL1002	1-518-508-00	s	CASSETTE COMPARTMENT 12V, 55mA
PM1001	1-454-415-11	s	12V 9.6/52ohm "T-IDLER"
PM1002	1-454-417-11	s	12V 12/90ohm "T-BRAKE"
PM1004	1-454-415-11	s	12V 9.6/52ohm "S-IDLER"
PM1005	1-454-417-11	s	12V 12/90ohm "S-BRAKE"
PM1006	1-454-284-00	s	12V 80ohm "SKEW"
PM1007	1-454-417-11	s	12V 12/90ohm "SEARCH"
PM1008	1-454-416-11	s	12V 7/35ohm "PINCH"
RV1001	1-237-215-11	s	VAR, CARBON 100k "TRACKING"
⚠S1001	1-570-117-31	s	ROCKER "POWER"
S1002	1-552-271-00	s	SLIDE "TIME"

15-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

Part No.	SP	Description
3-662-364-00	s	BAG, PROTECTION
3-701-630-00	s	BAG, POLY (FOR MANUAL) (FOR UC)
3-710-820-01	o	INDIVIDUAL CARTON
3-710-822-01	o	CUSHION (LOWER)
3-710-823-01	o	CUSHION (UPPER)
3-765-318-01	s	MANUAL, INSTRUCTION (FOR J)
3-765-318-21	s	MANUAL, INSTRUCTION (FOR UC)

15-5. FIXTURE (OPTIONAL)

Parts No.	SP	Description
J-6001-820-A	s	DRUM ECCENTRICITY GAUGE (3)
J-6001-830-A	s	DRUM ECCENTRICITY GAUGE (2)
J-6001-840-A	s	DRUM ECCENTRICITY GAUGE (1)
J-6001-930-A	s	DRUM ECCENTRICITY GAUGE (4)
J-6009-830-A	s	FLATNESS PLATE
J-6026-240-A	s	ADJUSTMENT DRIVER (FOR ELECTRICAL ALIGNMENT)
J-6130-010-A	s	REEL TABLE HEIGHT CHECK BASE JIG
J-6130-020-A	s	REEL TABLE HEIGHT CHECK JIG
J-6153-020-A	s	DIHEDRAL ADJUSTMENT SCREWDRIVER
Y-2031-001-0	s	CLEANING FLUID
2-034-697-00	s	CLEANING PIECE
3-702-215-01	s	TORQUE MEASUREMENT TAPE (100MM DIA.)
3-702-216-01	s	BACK TENSION ADJUSTMENT JIG
7-661-018-01	s	SONY OIL
7-732-050-20	s	TENSION SCALE (50G FULL SCALE)
7-732-050-30	s	TENSION SCALE (100G FULL SCALE)
7-732-050-40	s	TENSION SCALE (200G FULL SCALE)
7-732-050-50	s	TENSION SCALE (500G FULL SCALE)
8-960-015-04	s	ALIGNMENT TAPE, RR5-3SA
9-911-053-00	s	THICKNESS GAUGE
Standard Products	s	HEAD DEMAGNETIZER, HE-4